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THE MEDICINE AND DOCTORS OF HORACE.

By Eugene F. Cordell, M. D.

(Read before the Johns Hopkins Hospital Historical Club, November 12, 1900.)

In all ages of the world the doctor and his practice have been the shuttlecock of the wits and satirists. That medicine has not perished under these assaults must be ascribed to the unlimited faith of the human mind and to the leaven of good that even in the darkest period of its history has been mingled with its shortcomings and errors. In selecting an author of the Augustan age as representative of its sentiment and inspiration, none occurs to us with more convincing readiness than the great wit and lyric poet, the satirist of Roman manners and morals, the boon companion of Augustus and his prime minister, whose name heads this page. What has Horace to say of the doctors and medicine of his day?

It is a singular fact that nowhere in all his extant writings is there a word of unkindness or ridicule of the professors of medicine. Of few writers of his stamp could such a statement be made. His allusions are always kindly and breathe unfeigned respect and confidence. This will surprise us the more, when we reflect upon the character of the Roman profession of his day, just emerging from obscurity and chiefly in the hands of slaves and foreign adventurers, bent in most cases solely upon self-aggrandizement. Writing to a friend,[1] he gives this advice: "If your side or kidney should be attacked with an acute disease, seek a remedy for the disease," or as Sir Theodore Martin puts it:[2]

> "If spasms of pain assail your sides or back,
> Send for the doctor; set him on the track
> The mischief's cause and cure upon the spot."

[1] Epist. I, 6, 28.

[2] Metrical translation.

In another place he says:[3] "If no quantity of water would put an end to your thirst, you would tell it to your physicians."

And again:[4] "The false modesty of fools will conceal ulcers rather than have them cured."

During the latter half of the poet's life his health was poor, the first evidence of failure manifesting itself on the journey to Brundusium, when he was 28, in an inflammation of the eyes: "Here, having got sore eyes, I was compelled to smear black ointment on them."[5] He was also, like Virgil, a martyr to weak digestion. It is probable also that he had some affection of the chest, as in addressing his mistress Lyce, he says:[6] "This side of mine will not always be able to endure your threshold and the rain," and in Epist. I, 7, 26, he speaks of his "*non forte latus.*"

He must, therefore, have been brought into frequent contact with physicians in a professional way and it must be considered indeed remarkable that no word of blame or reproach of them escapes him. Take the case of the court physician, Antonius Musa. Horace was in the habit of spending his winters at Baiae, a beautiful seaside resort in Campania, not far from Naples. Here were hot medicinal waters, pleasant and wholesome, and a mild air. The wealthy Romans built their villas around and the brilliant society of Rome was transported thither during the cold weather. Horace never tires of singing the delights of "watery Baiae."

> "Baiae's waters fair
> With happy heart I hail."[7]
> "No bay in all the world so sweet, so fair,
> As may with Baiae, Dives cries, compare."[8]
> "Should winter swathe the Alban fields in snow,
> Down to the sea your poet means to go,
> To nurse his ailments and in cosy nooks,
> Close huddled up, to loiter o'er his books."[9]

Now imagine this small, frail, prematurely gray poet, with his weak digestion, his sore eyes, his "*non forte latus*," and his nervous temperament, "one to whom warmth is life,"[10] ordered by the medical autocrat of Rome, to give up his dear Baiae and go to take the cold baths at Velia or Salernum and this in midwinter. Ugh! he shivers at the thought, and yet no word of reproach escapes him—he has no thought of disobeying.

Horace also seems to reprobate ignorant handling of drugs in the following quotation:

> "Where is the man * * *
> Who ventures to administer a draught,
> Without due training in the doctor's craft?
> Doctors prescribe who understand the rules,
> And only workmen handle workmen's tools,"[11]

or to use a literal translation (and more fully):

"He that is ignorant of a ship is afraid to work a ship; none but he who has learned dares administer (even) southernwood to the sick; physicians undertake what belong to physicians; mechanics handle tools, but we learned and unlearned, promiscuously write poems."

Horace, evidently speaking from his personal experience, inculcates a sparing and plain diet. To his friend, Iccius, he says:[12]

> "Si ventri bene, si lateri est, pedibusque tuis, nil
> Divitiæ poterunt regales addere majus,"

or, as Theodore Martin translates it:

> "Let your digestion be but sound,
> Your side unwrung by spasm or stitch,
> Your foot unconscious of a twitch,
> And could you be more truly blest,
> Though of the wealth of kings possessed?"

This definition of health corresponds nearly with the soundness of "limb, wind and pizzle," which traders in horses are used to demand.

The word *medicus* occurs nine times in the writings of Horace. Addressing an imaginary miser, in Satire I, 1, 80, he says: "If your body should become disordered by being seized with a cold, or any other casualty should confine you to your bed, is there any one upon whom you can rely to stay with you, prepare the fomentations and beseech the doctor to bring you back to health and restore you to your children and dear relatives?" This passage recalls a letter written by Cicero to his learned freedman, Tiro, in which he urges the invalid to spare no expense—"another fee to the doctor may make him more attentive."[13]

Opimius, another miser, who thinks himself poor, although surrounded by heaps of silver and gold, is seized with a prodigious lethargy.[14] His heir, with unconcealed joy, is scouring about the house in search of keys and coffers. Then the quick-witted and faithful physician rouses his patient in the following way: He orders a table to be brought in and the bags of money to be poured out upon it and several persons to begin counting it. At the ring of the coin, the sick man jumps upon his feet, whereupon the doctor addresses him thus: "Do you not know that your ravenous heir will carry off your treasures unless you watch them?" "Not while I am still alive?" "Why, certainly; rouse yourself, man!" "But what must I do?" "Why, you must have food and restoratives; you are almost bloodless, already. Come no foolishness, take this bowl of gruel." "How much did it cost?" "Oh, a trifle." "But tell me exactly." "Two pence." "Alas! what does it matter whether I die of disease or by robbery and extravagance?" The disinterested character of the doctor is well brought out in this scene.

"'O Jupiter!'[15] thou who causest men to suffer and removest their afflictions (cries the mother of a boy confined

[3] Epist. II, 2, 46. [4] Epist. I, 16, 24. [5] Sat. I, 5, 30. [6] Od. III, 10, 19. [7] Martin, Od. III, 4, 24. [8] Martin, Epist. I, 1, 83. [9] Martin, Epist. I, 7, 10. [10] Epist. I, 20, 24. [11] Martin, Epist. II, 1, 114.

[12] Epist. I, 12, 5.

[13] "Roman Life in the Days of Cicero," by Prof. Church, 1881.

[14] Sat. II, 3, 142. See Celsus Lib. III, 20, who says it is a dangerous acute disease with paroxysms and fever, probably congestive chill.

[15] Sat. II, 3, 88.

to bed for five months), if this quartan chill shall at thy command leave my child, on thy fast day he shall be placed naked in the Tiber.' Should chance or the doctor relieve the patient from his imminent danger, the superstitious mother will destroy her child by placing him on the cold bank and bringing back the fever."

"A new disorder expelled the old in a miraculous manner, as it is accustomed to do, when the pain of the afflicted side or head is turned upon the stomach; or as it is with a man in a lethargy, when he turns boxer and attacks his physician."[15a]

To Maecenas, he writes:[16] "In this case" (*i. e.*, where the judgment is disordered), "you think me mad, only as the generality of men are mad, and you do not laugh or believe that I stand in need of a doctor, or of a guardian assigned by the praetor."

To his friend Celsus, he writes,[17] more of his mental than his physical troubles, "Diseased as I am, I am willing to hear nothing which may relieve me, I am displeased with my faithful physicians and am angry with my friends for their unceasing efforts to rouse me from my fatal lethargy."

To Augustus, he writes:[18] "He that knows naught of ships will be afraid to work one; none but those who have been taught will dare administer to the sick even a dose of southernwood; mechanics handle tools, doctors stick to their medicines, whilst we poets write verses whether we are learned or unlearned."

To his friend, Julius Florus,[19] he writes: "If no abundance of water should relieve your thirst, you would tell it to your physicians."

Horace mentions by name two physicians—Antonius Musa and Craterus; perhaps a third person of distinguished medical attainments is named—I will discuss this question later.

Antonius Musa, a highly educated Greek freedman of Augustus, was led to the study of medicine by a desire to relieve his father, who suffered from great infirmities. He acquired very great honor and distinction by curing his master of a severe attack of illness, which had resisted all previous attempts at cure, and seemed likely to prove fatal. Of the nature of this attack we are not positively informed (some say gout) but it had been treated by hot fomentations and sweating without relief. The case seeming so desperate, a change of physicians was determined upon and Musa was placed in charge. Bold and decisive action seemed to be demanded and consequently the entire previous method of treatment was reversed. Cold douches were freely applied and the august patient was drenched with draughts of cold water. With these measures, whether *post* or *propter hoc*, he recovered and, although his health was always delicate, he lived for 36 years after this critical illness. By this happy termination, the physician reaped a rich reward. He was invested with citizenship and the order of knighthood; a large sum of money was bestowed upon him by Augustus and the Senate, and his statue in brass, erected by public subscription, was placed by the side of that of the God of Medicine, in the temple of Aesculapius, which stood on an island in the Tiber. Nor did he alone profit by his good fortune; it was shared in large measure by all the disciples of Hippocrates in Rome, who now, for the first time, acquired citizenship, and were relieved from all civil burdens. The Methodists—the sect to which Musa belonged—naturally profited most by this elevation and became the predominant body in the profession of the Roman capital. Cold bathing became of course the fashionable fad, and winter offered no bar to its use. In Epist. I, 15, Horace asks his friend Caius Neumonius Vala about Velia and Salernum, two winter resorts; he wants to know about their climate and air, their people, roads, water, corn, fish, hares and boars. He had long been in the habit of spending his winters at Baiae, where there were warm sulphur springs famous in the treatment of nervous disorders. But now that delightful resort is deserted, its myrtle groves are silent and the villagers are murmuring against the fashionable physician, who has deprived them of their patronage and Horace is preparing to follow Musa's directions and the crowd, and seek waters less relaxing and of lower temperature. Musa was also the physician of Maecenas, and it is related that he employed the distant murmuring of falling water for that statesman's terrible insomnia, obtaining, however, only temporary relief by this measure for his patient, everything failing at last. He was the intimate friend of Virgil, who praises his taste and skill in an epigram, affirming that he was loaded with all the favors of Apollo and the muses.[20] He is spoken of by Dion Cassius, Caius Plinius Secundus and Galen. The last-named quotes him frequently. Strange to say he is not mentioned by Celsus. He introduced into practice the lettuce, chicory and endive and was the author of several pharmaceutical works of which only a few fragments remain. These were collected and published by Flor. Caldani, in 8vo, Bassano, 1800. Several medicinal compositions bearing his name enjoyed celebrity for a long time. Musa had a brother, Euphorbus, who was physician to Juba, King of Mauritania, and who discovered and gave his name to the plant Euphorbia.

In the imaginary conversation in which Damasippus maintains that most men are mad,[21] the philosopher Stertinius is represented as saying: "Suppose that Craterus" [the physician] "should pronounce a patient free from disease of the stomach" [*non cardiacus*],[22] "is he therefore well and shall he get up? No, the doctor will forbid that because he is suffering from an acute pleurisy or nephritis." And so he argues, if a man is not insane in one direction, he is in another. Craterus was likewise a Greek, and stood in high

[15a] Sat. II, 3, 27. [16] Epist. I, 1, 101. [17] Epist. I, 8, 7.
[18] Epist. II, 1, 114. [19] Epist. II, 2, 146.

[20] Virgil's Catalecta. [21] Sat. II, 3.

[22] Hecker believes that the disease known as "*Cardiacus*" has disappeared and that it was peculiar to antiquity. Védrenès, Traité de Celse, Paris, 1876.

repute in Rome; Sir Theodore Martin calls him the "Abernethy of his day." He is mentioned a number of times by Galen. Cicero writes to his friend Pomponius Atticus (B. C. 45) upon hearing of the illness of the latter's daughter: "*De Attica doleo*"—"*credo autem Cratero.*" Persius writes:[23]

> "Venienti occurrite morbo,
> Et quid opus Cratero magnos promittere montes,"

"meet the disease at its first stage and what occasion is there to promise Craterus gold mines for a cure?" Porphyry[24] gives an account of the cure by him of a slave attacked with a horrible disease, in which the flesh separated from the bones. He also invented an antidote against the sting or bite of venomous animals.

The name Celsus occurs twice in the writings of Horace—Epist. I, 3 and Epist. I, 8. The first is addressed to Julius Florus, who has gone to Asia Minor, 20 B. C., A. U. C. 733, as companion of Claudius Tiberius Nero, Augustus' stepson and successor in the imperial chair. Tiberius, who was himself but 22, was accompanied on this occasion (his Armenian expedition), by a number of young Romans of taste and genius—the "*studiosa cohors*," as Horace calls them—among whom were philosophers, historians, orators, poets and doubtless a physician or two. "What works is the studious train pursuing?" asks the poet. Among others he refers to one named Celsus, and in the following words: "What is my dear Celsus about? already advised he shall be advised again and again,[25] to collect treasures of his own, and to let alone writings, which are stored in [the library of] the Palatine Apollo, lest, if it should chance that the flock of birds should hereafter come to claim their feathers, he, like the jackdaw, should be stripped of his stolen colors and become the subject of ridicule." The reference is to the well-known fable of Æsop. The library here referred to was one which had been founded by the Emperor Augustus in his palace on the Palatine Hill, next to the temple of the god. It was designed for the use and encouragement of literary men and is several times referred to by Horace.[26] Here was collected the literature of the world, all the writings which were judged worthy of "cedar and immortality." Hither gathered scholars of every kind to consult the literary treasures, and it is said that the physicians here gave instruction to their pupils. The question naturally arises—may not the great medical writer Celsus have here prepared those compilations of philosophy and medicine, of which the eight books "*De Medicina*," written in most elegant Latin alone survive to this day? May not the young Celsus mentioned by Horace have been the great author himself?

Epist. I, 8 was addressed to *Celsus Albinovanus*, whom Horace describes as the attendant and secretary of Tiberius Claudius Nero, the general in the Armenian campaign already referred to. The use of medical terms in this epistle is somewhat significant: "I will hear nothing, learn nothing that may alleviate my sickness; I am displeased with my faithful physicians, I am angry with my friends who are striving earnestly to rouse me from my fatal lethargy." The whole tenor of these letters shows that the greatest intimacy must have existed between the writer and young Celsus, and that the former entertained for the latter an interest which was both fatherly and disinterested, for the language, as has been remarked by Orelli and others, was not intended in any offensive sense.

Now we know almost nothing about the medical writer Celsus. The date and place of his birth, residence and death, are alike unknown. Even his name is in doubt, some maintaining that the first initial "A," stood for Aulus, others that it meant Aurelius. That he was a member of the Cornelian family, to which so many illustrious men belonged, indicates a patrician rank. It is uncertain whether he was a practicing physician, with the probabilities much in favor of the negative; yet his minute and accurate descriptions of diseases, instruments and operations, his profound and independent judgment and his frequent references to his personal experience, show a practical knowledge of the subject which could only have come from prolonged observation and actual participation.

What we do know of him is that he compiled a great encyclopædic work on various branches of learning of which his eight books on medicine alone survive to this day. The extent of this work, and the versatility of its author, are shown by its embracing elaborate treatises on rhetoric, philosophy, military science, agriculture (including a section on veterinary science) and medicine. According to Gurlt,[27] this compilation occupied some fifty or more years of the author's life, the part on rhetoric having been written in the last decennium before Christ and that on medicine at the beginning of the fifth decennium after Christ under the Emperor Claudius. The treatise on medicine was the first medical work written in the Latin language and the most important one of antiquity after Hippocrates. To it we owe almost all that we know of the previous 400 years, and of the great Alexandrian School of anatomists and surgeons. Our high estimate of it is not invalidated by the fact that it was written for laymen, or by the neglect which it met at the hands of Celsus' contemporaries and successors for many centuries, in fact until the revival of learning in the 15th century. Its purity of style and literary excellence render it a worthy companion of the great non-medical classics of the Augustan age and have caused Celsus to be termed the "*Cicero Medicorum.*" That it was not appreciated by the profession of Rome is probably to be attributed to two circumstances: 1, That it was addressed to laymen; 2, that the profession of Rome was made up almost entirely of Greek physicians.

[23] Sat. III, 64. [24] *De Abstinentia ab Animalibus*, I, 17, 61.

[25] Of the use of the verb *moneo* here I find this in Gulielmus Braunhardus, "*Quinti Horatii Flacci, Opera Omnia*," Leipzig, 1835: "*monemus jure quodam nostro et auctoritate; hortamur fere argumentis, Cruq.*"

[26] Sat. I, 4, 22; Sat. II, 10, 38; Epist. II, 1, 216; Epist. II, 2, 94.

[27] *Geschichte der Chirurgie*, Vol. 1. See also Bähr, *Geschichte der Röm. Literatur.*

Is it possible to identify the Celsus of Horace with the Celsus of medicine? It would have been nothing unusual, if the young courtier, who had been honored by Tiberius with the appointment of secretary, were well acquainted with medical science, for it constituted, no less than philosophy, a part of the education of all high-born Romans, who often found in the "ampla valetudinaria,"[28] upon their large country estates, abundant opportunities for the practical exercise of such knowledge. Again, to write such a work as that of A. Cornelius Celsus, required access to a very large collection of books, such as he would have found no where in Italy except in Rome. He must therefore have repaired to Rome, if not already a resident of the metropolis, in order to carry on his researches, and if this be granted, where would he have found such opportunities for work as in the great collection of Augustus—the public library on the Palatine Hill? Here then, we find two men of the name of Celsus, simultaneously engaged in transcribing and compiling, not once but habitually and evidently for publication. What is the inevitable inference? That they are one and the same person.

The name, *Albinovanus*, seems at first sight to offer an insurmountable obstacle to this theory. Let us consider, briefly, the nomenclature of Roman proper names. Every free-born Roman of the higher class had three names, I. an individual name or prænomen, as Aulus, Caius, Marcus, Publius, Quintus, etc. The number of these was limited. They were considered titles of honor and as such were highly prized, as Horace says: "*gaudent prænomine molles auriculae.*"[29] II. The gens name or nomen, as Claudius, Cornelius, Julius, Tullius, Virgilius. III. The individual family name or cognomen, as Crispus, Maro, Naso, Plautus, Seneca. The cognomen was sometimes assumed, "*optivum cognomen*"; often it was conferred by the public:

"frequentia Mercuriale
Imposuere mihi cognomen compita,"[31]

"the crowded streets gave me the surname Mercurial." I imagine that such cognomina as canis,[32] pinguis,[33] Asina[33a] and Asellus,[33b] were rather in the nature of nicknames; they would hardly have been adopted voluntarily by their holders. An additional cognomen was often added to a name to indicate some circumstance of life, or character. In later times this was called "*agnomen.*" Such were Africanus, Asiaticus, Numantinus, Capitolinus, Torquatus, Germanicus, Justus, Felix, Declamator. Thus are Publius Cornelius Scipio Africanus, Lucius Cornelius Scipio Asiaticus, Publius Aemilianus Scipio Numantinus, Lucius Annæus Seneca Declamator, Lucius Calpurnius Piso Frugi, Decius Junius Brutus Scaeva and Albinus, Quintus Fabius Maximus Cunctator, Spurius Postumius Albinus Magnus and Regillensis, and many others. Sometimes in the case of very distinguished men there was more than one of these additional cognomina or titles, and it was no unusual thing for names to undergo change in course of time, old titles being dropped and new ones assumed. Among friends, the mode of address was usually by the gens nomen or the cognomen, the prænomen being reserved for formal or polite address, something like Mr., Rev., Dr., Sir. In eight of the epistles of Horace, omitting doubtful ones, his correspondents are addressed by their cognomina; in six the gens name is used and in one both; not once is the prænomen used. The same rule prevails throughout the entire work, the prænomen never being employed. The poet refers to himself most often as Horatius, once only as Flaccus and once as Quintus. Of Latin authors who mention him, according to Horace Delphini, eight speak of him as Horatius and five as Flaccus. From all this, we may conclude that in "*Celsus Albinovanus*" the poet has omitted part of the name of his friend, quite certainly the prænomen and most probably the gens name also, especially as we never find "Celsus" used in this sense. "Celsus," then being the cognomen or third name, what shall we say of "Albinovanus." Its position here, as well as in the names Marcus Tullius Albinovanus, Caius Pedo Albinovanus and Publius Tullius Albinovanus also mentioned in the literature, show that it was a cognomen and not a family or gens name, one therefore least important and most liable to change. It may have been an accidental name, by which he was known to his intimate friends or in early life, but dropped later when he achieved reputation and literary renown, the other three containing all that a Roman patrician required.[34]

I have examined a great many editions, lives, translations, etc., of Horace with reference to this theory, and have found it mentioned but once[35] and then with disapproval. It seems to have been first brought forward and championed by Bianconi, an Italian author, in 1779.[36] I have not been able to find Bianconi's work in the libraries here and have therefore not been able to avail myself of his arguments. Targa, the author of the best text of Celsus,[37] and Sprengel in his great history of Medicine,[38] both agree with him.

Finally, a possible explanation of "Albinovanus" is found in a German translation of the Epistles of Horace by Carl Passow, Leipzig, 1833. He translates Celsus Albinovanus, "*C. of Albinova*," thus implying that this term indicated the place of his birth or residence. This would assimilate it still closer to the accidental cognomina, to which I have referred. I have met with this explanation nowhere else, and I have not been able to find any such place as Albinova in any of the geographical dictionaries, but it appears both plausible and reasonable. The termination "anus" would

[28] *Celsus*, Praefatio. [29] Sat. II, 5, 32. [30] Epist. II, 2, 10.
[31] Sat. II, 3, 25. [32] Sat. II, 2, 56. [33] Sat. I, 3, 58.
[33a] Epist. I, 13, 8. [33b] Sic. & Liv.

[34] Orelli regards "Albinovanus" as an "agnomen;" 3d ed. (Baiterus), 1852.

[35] Orellius, *op. cit.*

[36] Bianconi, *Lettere sopra A. Cornel. Celso*, Rom, 1779, 8°, deutsch von S. Ch. Krause, Leipz., 1781.

[37] Targa; Leonard, 1st ed., Padua, 1769; 2d, 1810; 3d, 1815.

[38] Sprengel (French trans., Paris, 1815, 9 vols.) says "infinitely probable." Targa devoted 70 years to the study of Celsus; all authors since his day have adopted his text.

correspond with Romanus, Trojanus, Albanus, etc., and the name Albinovanus certainly suggests place. "albi" or "albia nova." There were several towns of the name albi or albia, and there was an Alba Longa, an Albamarla, an Albamala, an Albamana, and many similar combinations. The termination "anus" indicates a double word since the adjective termination of polysyllables was not "anus" but "ensis."

It is pleasant, thus, to contemplate Horace as the friend of our Roman Hippocrates, and I feel sure that the works of the genial poet will afford us increased delight from the contemplation of this tie between our profession and him.

The following diseases are mentioned in Horace: dropsy, *dirus hydrops;* consumption, *macies;* malaria, *quotidiana, quartana frigida;* fever, *febris;* pleurisy, *dolor laterum, dolor miseri lateris, morbus lateris acutus; polypus nasi;* headache, *dolor capitis;* dyspepsia, *dolor cordis;* lethargy, *lethargus, veternus;* insanity, *iracunda Diana, furor, insania, rabies;* ulcer, *ulcus, ulcera incurata;* hydrophobia, *rabies canis, rabiosa canis;* diabetes [if the lines

"Si tibi nulla sitim finiret copia lymphæ,
Narrares medicis;"

justify this diagnosis]; wound, *vulnus;* itch, *scabies;* jaundice, *morbus regius;* cold, *frigus;* conjunctivitis, *lippitudo;* strabismus, *strabo;* club-foot, *male pravæ tales, crura distorta;* wart, *verruca;* protuberance, *tuber;* a horny growth on the forehead, *frons exsecto cornu;* fracture of the leg, *crus fractum;* Campanian disease, *morbus Campanus* [a skin eruption accompanied by pimples or warts]; mole, *nævus;* gout, *nodosa* (knotty) *chiragra, tarda* (crippling) *podagra;* cough, *tussis;* wax in the ear, *auriculæ dolentes collecta sorde;* plague, *pestis; canities,* and bites of dogs and serpents.

The allusion to dropsy is strikingly graphic: As the love of money increases with its gratification, so "the direful dropsy increases by self-indulgence, nor does it extinguish its thirst, unless the cause of the disease has departed from the veins, and the watery languor from the pallid body."[39] There is an allusion to this affection also in Epist. I, 2, 34: "*Si noles sanus, curres hydropicus,*" "although you are unwilling to move when well, you will run fast enough" [to the doctor], "when you get the dropsy." The origin of consumption and fevers, as a retribution for the theft of fire from heaven by Prometheus, is strikingly put—

"macies, et nova febrium
Terris incubuit cohors,"[40]

as if they were swarms of noxious winged creatures. The polypus of the nose,[41] resembled more ozæna, from the fetid odor which accompanied it, than what we know as polypus. The word scabies occurs three times. "*Occupet extremum scabies,*"[42] "the devil take the hindmost!" The jaundice is called "*morbus regius,*" not because like scrofula in later times, it was curable by the king's touch, but because, in its treatment, it required care and delicacies which are supposed to be attainable only by royal personages.[43] *Colligere frigus* is "to catch cold"; *tentatus frigore* is "seized with a cold." "*Hic oculis ego nigra meis collyria lippus illinere,*"[44] "here I anointed my inflamed eyes with black ointment." What this black ointment was is not stated in any of the commentaries; Celsus gives the formulæ for several, among which this may possibly be. Again we have "*lippus inungi,*"[45] "*Crispinus lippus,*"[46] and "*oculis lippus inunctis.*"[47] The crippling effects of gout are portrayed at Sat. II, 7, 14: "That buffoon Volanerius, when the deserved gout had crippled his fingers, maintained a fellow, hired by the day, to take up the dice and put them into a box for him." The removal of the horny growth from the forehead of Messius, spoken of in the description of the journey to Brundusium,[48] was doubtless effected by some surgeon; an ugly scar attested the operation. The Cæsarean operation is clearly referred to in the *De Arte Poet.*, 339: "Nor take out of a witch's belly" [*alvo*], "a living child, that she had dined upon." In Sat. II, 3, we have a discussion of insanity, with a description of various types. It enumerates many well-known forms but omits others. There is no mention, *e. g.*, of general paralysis of the insane (referred to by Pliny), nor of alcoholic, puerperal or epileptic insanity. Although but a desultory description, it is worth a closer study.

In Horace's physiology, the liver secreted bile as now, but figuratively it was also the seat of anger and lust.

"meum
Fervens difficili bile tumet jecur,"[51]

"My inflamed liver swells with bile difficult to be repressed."

"libido
Saeviet circa jecur ulcerosum,"[52]

"And hot lust shall rage about your ulcerous liver." "*Non ancilla tuum jecur ulceret ulla,*"[53] "let no young slave inflame your liver." "*Meum jecur urere bilis,*"[54] "anger galled my liver" [because his dear friend Fuscus Aristius would not take the hint, when he was tormented by the bore on the Via Sacra].

"Exucta uti medulla et aridum jecur
Amoris esset poculum,"[55]

"that they" [the witches] "might have a love-filter from the parched marrow and dried liver" [of the boy]. At Od. IV, 1, 12, the poet advises Venus to seek Paulus Maximus, "if she desires to inflame a suitable liver:" "*si torrere jecur quæris idoneum.*" In Od. III, 4, 77,

"nec Tityi jecur
Relinquit ales,"

"the vulture feeds continually on the liver of Tityus" [the giant, who had attempted violence upon Latona]. And finally, we find this mention of the bile in Sat. II, 2, 75:

"Dulcia se in bilem vertent, stomachoque tumultum
Lenta feret pituita,"

[39] Od. II, 2, 13. [40] Od. I, 3, 30. [41] Epod. XII, 5.
[42] De Arte Poet.
[43] See Celsus, lib. III, 24. [44] Epist. I, 2, 13. [45] Sat. I, 1, 80. [46] Sat. I, 5, 30. [47] Epist. I, 1, 29. [48] Sat. I, 1, 120. [49] Sat. I, 3, 25. [50] Sat. I, 5, 58. [51] Od. I, 13, 3. [52] Od. I, 25, 15. [53] Epist. I, 18, 72. [54] Sat. I, 9, 66. [55] Epod. V, 37.

which Martin translates—

"what tasted so sweet
Will be turned into bile, and ferment, not digest, in
Your stomach, exciting a tumult intestine."

The spleen is not once mentioned, and with Horace it was "to vent the bile," not "the spleen."

Cor is used for heart or stomach, *præcordia* for heart, chest or intestines. *Ilia* is also used in the last-named signification. "*Vitio tumidum cor,*"[56] "heart swollen with vice"; "*tetigisse cor querela,*"[57] "to move the heart with complaint"; "*corde tremit,*"[58] "trembles in her heart"; "*in cor trajecto dolore,*"[59] "the pain being transferred to the stomach." "*Ilia rhombi,*"[60] "the entrails of a turbot"; "*O dura messorum ilia,*"[61] said of those who eat garlic; *ducere ilia,*"[62] "to become broken-winded." "*Humana exta*"[63] is "human viscera." "*Tenta spiritu præcordia,*"[64] "my chest strained with gasping"; "*condita cum verax aperit præcordia Liber,*"[65] "when truth-telling Bacchus opens the secrets of his heart";

"leni præcordia mulso
Prolueris melius,"[66]

"you will with more propriety wash your stomach with soft mead"; "*quid hoc veneni saevit in præcordiis,*"[67] "what poison is this that rages in my entrails?" [said of the garlic]; "*et inquietis assidens præcordiis,*"[68] "and brooding upon your restless breasts"; "*inæstuit præcordiis,*"[69] "boils in my breast."

The lungs are not mentioned once, and the medulla [besides the quotation already given] only in this passage: "*certius accipiet damnum propiusve medullis,*"[70] "and nearer to his marrow."

Disease of the nerves is referred to once only,[71] but "*nervi*" is to be understood rather as signifying tendons and muscles than nerves. "*Cerebrum*" is used for brain or head: "*truncus illapsus cerebro,*"[72] "*felix cerebri,*"[73] "*putidius multo cerebrum.*"[74] "*Cerebrosus*"[75] indicates "a choleric fellow."

"Foul lust" inflames the veins[76] as well as the liver. Wine flows into the veins.[77] The cause of disease resides in the veins.[78] "To commit to the empty veins."[79] There is no mention of the arteries (Celsus uses "venæ" as a general term for both).

"*Venter*" is used almost always for the organ of digestion, but in Epod. XVIII, 50, it signifies the womb, and in Epist. I, 15, 36 the abdomen, "*urere ventrem,*" "to brand the abdomen." "*Stomachus*" also generally implies the organ of digestion, but once it is used to signify "anger," once "breast" and once "disposition."

"*Guttur frangere*"[80] is to break one's neck; "*cervicem frangere*"[81] is used in the same sense.

The midwife is referred to once:

"et tuo
Cruore rubros obstetrix pannos lavit,
Utcunque fortis exsilis puerpera,"[82]

"and the midwife washes the rags, red with your blood, as often as you bring forth, springing up with unabated vigor." This is said in derision of Canidia the witch. "*Laudantur simili prole puerperæ,*"[83] "mothers are praised for the resemblance of their offspring," an allusion to the blessings Augustus had conferred upon his country.

"Diana, quae laborantes utero puellas,
Ter vocata, audis, adimisque letho,"[84]

"Diana, who when thrice called, hearest young women in the throes of childbirth and snatchest them from death."

Constipation is referred to in the words, "*dura morabitur alvus.*"[85]

Horace's materia medica is singularly limited. Of drugs he mentions the following only: "*malva,*"[86] mallows; "*lapathum,*"[87] sorrell; "*elleborum,*"[88] hellebore; "*abrotanum,*"[89] southernwood; "*cicuta,*"[90] hemlock; "*papaver,*"[91] poppy.

The mallow was used for food and also as a remedy for various disorders, as indigestion, irritation of the kidney and bladder, etc.: "*gravi malvæ salubres corpori.*"[92] Celsus recommends it frequently as an emollient and laxative.

There were two varieties—the cultivated, *sativa*, and the wild, *silvestris*. The mallow ("*althæa*") is still employed in medicine as a demulcent and emollient. The root of the plant which grows in salt marshes and other moist places is alone officinal. It is obtained from Europe.

The sorrel, known among the Greeks as "*lapathon*" and among the Romans as "*rumex,*" grows also in swamps. It was described by Pliny and Dioscorides, according to the latter being stomachic, laxative and diuretic. Celsus recommends it as a laxative. It is still embraced in our materia medica, having an agreeable sour taste (due to acid oxalate of potassium) and valuable antiscorbutic properties.

Hellebore was in great repute in the treatment of insanity. According to Pliny,[93] it will cure paralysis of the insane ("*paralyticus insaniens*"), expelling bile, fæces and mucus and with these "the melancholy humor." The same author states that the illustrious tribune, Drusus, was cured by it of epilepsy. Celsus does not mention it. The plant was found in great abundance on the island of Anticyra, in the Aegean Sea, and thither wealthy patients with mental disorders were sent to undergo courses of treatment with it. Hellebore (known as "*Helleborus Orientalis*") is still found growing in the Island of Anticyra. It is distinct from the black hellebore, which is also found in Greece, though probably possessing similar properties.

[56] Sat. II, 3, 213.
[57] De Arte Poet., 98.
[58] Od. I, 23, 8.
[59] Sat. II, 3, 28.
[60] Sat. II, 8, 30.
[61] Epist. III, 3, 4.
[62] Epist. I, 1, 9.
[63] De Arte Poet., 186.
[64] Epod. I, 18, 25.
[65] Sat. I, 4, 89.
[66] Sat. II, 4, 26.
[67] Epod. III, 5.
[68] Epod. V, 95.
[69] Epod. II, 15.
[70] Epist. I, 10, 28.
[71] Epist. I, 15, 6.
[72] Od. II, 17, 27.
[73] Sat. I, 9, 11.
[74] Sat. II, 3, 75.
[75] Sat. I, 5, 21.
[76] Sat. I, 2, 33.
[77] Epist. I, 15, 18.
[78] Od. II, 2, 14.
[79] Sat. II, 4, 25.
[80] Epod. III, 2.
[81] Od. II, 13, 6.
[82] Epod. XVII, 50.
[83] Od. IV, 5, 23.
[84] Od. III, 22, 2.
[85] Sat. II, 4, 27.
[86] Od. I, 31, 16; Epod. II, 58.
[87] Sat. II, 4, 29; Epod. II, 57.
[88] Sat. II, 3, 82; Epist. II, 2, 137.
[89] Epist. II, 1, 114.
[90] Epod. III, 3; Sat. II, 1, 56; Epist. II, 2, 53.
[91] De Arte Poet., 375.
[92] Epod. II, 57.
[93] Lib. XXV, ch. 15.

The *abrotanum* (southernwood) was an evergreen plant, of very bitter taste; both leaves and seed were employed and were considered by Pliny and others to be highly useful in diseases of the nerves, coughs, lumbago, urinary difficulties, poisoning, etc. Celsus recommends it as a diuretic in dropsy. In the last edition of the U. S. D., the leaves of *Artemisia Abrotanum*, L., or southernwood, are said to have a fragrant odor and a warm, bitter, nauseous taste and to have been formerly employed as a tonic, deobstruent and anthelmintic. It is allied to the *Artemisia Absinthium*, from which the intoxicant absinth is derived.

The *cicuta* (hemlock) was a painless poison, producing narcotism with coldness of the body. Among the Athenians, those condemned to death were compelled to drink its juice; thus perished Socrates and Phocion. It is mentioned twice by Celsus. The effects of the modern conium which is supposed to be identical with it, are anodyne, soporific and antispasmodic. "After toxic doses, the muscular prostration is extreme, the eyelids drop from weakness, the voice is suppressed, the pupils dilated, the light almost lost; consciousness is usually preserved to the last and life is finally extinguished without a struggle. . . . Probably the most frequent use of it is by alienists for the production of calm in maniacal excitement." (U. S. D.)

"*Sed mala tollet anum vitiato melle cicuta*,"[94] "the deadly hemlock in the poisoned honey will take off the old dame"; *cicutis alium nocentius*,"[95] "garlic more baneful than hemlock."

The poppy is mentioned in "*De Arte Poet.*," 375: "*Sardo cum melle papaver*," "the poppy mixed with Sardinian honey," rendering it very bitter and therefore cheap. The papaver, both "*album*" and "*nigrum*" is often spoken of by Celsus in connection with its hypnotic effects.

"*Fomenta*," both hot and cold are mentioned: "*Fomenta vulnus nil malum levantia*,"[96] "applications that give no ease to the desperate wound"; "*fomenta parare*";[97] "*frigida curarum fomenta*,"[98] "the cold fomentations of care." In Epist. I, 2, 52, fomentations are said to be "as useful to the gout as paintings to the blind or music to the deaf," from which we may infer that they were not in much esteem in that disease.

Baths, cold, hot and sulphur, are frequently referred to. It is well known how large a part they took in Roman life, both in health and disease. It is singular that there is no mention of blood letting or cups which were then in frequent use. The leech (first recommended by Themison, Horace's contemporary) is mentioned once and is the very last word in the book:

"*Non missura cutem, nisi plena cruoris, hirudo*," "a leech that will not quit the skin till saturated with blood"; this is said of the "*recitator acerbus*," "the merciless reciter of verses," "the mad poet." It is not mentioned by Celsus.

There are several allusions to the unhealthfulness of the autumn season at Rome; "the sickly hours of September";[99] "the sickly season of autumn";[100] "the undertaker with his black attendants, active in autumn,"[101] or as Martin interprets it:

> "this deadly time of year,
> When autumn's clammy heat and deadly fruits,
> Deck undertakers out and inky mutes;
> When young mammas, and fathers to a man,
> With terrors for their sons and heirs are wan,
> When stifling anteroom or court distills
> Fevers wholesale, and breaks the seal of wills."

Again

> "the southern breeze
> That through the autumn hours wafts pestilence and bale."[102]

From line 302, *De Arte Poet.*, there would seem to have been a custom among certain of the Romans of submitting to an annual vernal purgation:

> "O ego lævus
> Qui purgor bilem sub verni temporis horam."

In Epod. XVIII, 35, Horace calls the witch Canidia, a shop or laboratory of poisons, "*venenis officina Colchicis*," just as we now say a man is "an encyclopædia of knowledge."

In Sat. II, 5, 7, Ulysses finds neither his "*apotheca*," *i. e.*, "cellar" or "storehouse," nor his flock, untouched by the suitors of Penelope.

Among those who grieve over the death of the singer, Tigellius, are the "*pharmacopolæ*,"[103] a term which Smart says was a general appellation for all dealing in spices, essences and perfumes. It is probable that they also dispensed drugs to the poorer classes.

[94] Sat. II, 1, 56. [95] Epod. III, 3. [96] Epod. XI, 17. [97] Sat. I, 1, 82. [98] Epist. I, 3, 26. [99] Epist. I, 16, 16. [100] Sat. II, 6, 19. [101] Epist. I, 7, 6. [102] Martin, Od. II, 14, 15. [103] Sat. I, 2, 1.

A HISTORICAL NOTE UPON DIPTERA AS CARRIERS OF DISEASES—PARÉ—DÉCLAT.

By Howard A. Kelly, M. D.

(*Read before the Johns Hopkins Hospital Historical Club, Monday, March* 11, 1901.)

It is with no little sense of satisfaction that the surgeon contemplates the recent enormous advance so unexpectedly made in the direction of hygiene and preventive medicine, an advance of even greater significance I am inclined to think than the discovery of Jenner, and one which is fairly comparable to the introduction of the antiseptic principle into surgery.

It is a curious fact that our greatest acquisitions sometimes steal upon us so silently and so unheralded that before we know that any change has occurred a new principle has

been quietly evolved, and we find ourselves in possession of facts destined within a few years to save millions of lives and a vast sum of morbidity, where life is not lost. Such too is the case with this recent greatest medical discovery of the significance of the diptera and other insects as intermediary hosts and conveyers of contagion.

The interest in the subject which has been aroused in this country can be inferred from these admirable monographs and papers, some of which I here present to the Society:

Geo. H. F. Nuttall, On the Rôle of Insects, Archnids and Myriapods as Carriers in the Spread of Bacterial and Parasitic Diseases of Man and Animals. The Johns Hopkins Hospital Reports, Baltimore, 1899.

Victor C. Vaughan, Conclusions reached after a Study of Typhoid Fever among the American Soldiers in 1898. Jour. Am. Med. Assoc., June 9, 1900.

Geo. M. Kober, Report on the Prevalence of Typhoid Fever in the District of Columbia, published in the Health Officer's Report for 1895. I have to thank Dr. Kober for this manuscript copy of his investigations.

Walter Reed, The Etiology of Yellow Fever. Jour. Am. Med. Assoc., Feb. 16, 1901.

Charles Finlay, The Mosquito Theory of the Transmission of Yellow Fever, with Its New Developments. Medical Record, Jan. 19, 1901.

L. O. Howard in the Proceedings of the Washington Academy of Sciences presents most valuable data in "A Contribution to the Study of the Insect Fauna of Human Excrement," Washington, 1900; Dr. Howard collected 77 species of diptera, of which 36 species were found to breed in human excrement. The commoner and more important forms can easily be identified by means of the admirable figures scattered through the text.

Previous to this article no systematic attempts had been made to identify the species, all of which were simply spoken of generically as "flies."

L. O. Howard, Ph. D., remarks that in general there may be said to be three predominant types of flies, the medium-sized gray, of the type of the common house fly (musca domestica), the metallic green and blue bottle flies, and the small dark brown or black flies of the Homalomyia type.

Several species belonging to the different families so closely resemble the house fly that they cannot be distinguished without a close study of structural characters.

I know myself by questioning friends during many past summers that few laymen even recognize the difference between the common house fly and the gray horse fly of the same size (stomoxys calcitrans) with his prominent biting proboscis.

The importance of the recognition of specific differences is manifest when we come to study the life history of flies with a view to extermination.

An instructive article for the lay scientific world by Dr. Howard will be found in the Popular Science Monthly for Jan., 1901.

My object in presenting this matter to the Society this evening is, however, not to review a subject already very large but simply to present two brief historical notes which I think have as yet escaped the attention of any writer. I am glad that my little historical investigations in both instances serve to illuminate the great genius of our French confreres and add but another to the many instances in which they have been shown to lead the world in the field of science.

The first clear statement as to any definite relationship existing between flies and disease as that of cause and effect is found in the works of Ambroise Paré in his "Apologie, et Traité contenant les Voyages Faits en Divers Lieux," where he describes how after the battle of St. Quentin (155?) he was sent by the king to la Fere in Tartenois. Arriving at la Fere, Paré was charged as he was about to return by M. le Mareschal de Bourdillon to remain and dress the wounded survivors of the battle, "which," as he tersely says, "I did" ("ce que je fis").

He found the wounds excessively fetid and full of worms with gangrene and corruption; and it was necessary to give free play to the amputating knives in removing the decay in cutting off arms and legs; there were also sundry trephinings. To stop the gangrene and kill the worms he washed the wounds with Egyptiacum dissolved in wine and brandy, but in spite of all his cares a great number died.

Now there were at la Fere some gentlemen charged with the business of finding the dead body of M. de Bois-Dauphin the elder, who had been killed in the battle, and they begged Paré to assist them in their search, but it was impossible to recognize him as the bodies were all so far gone in corruption and the faces so disfigured. "For more than half a league around, the earth was covered with dead bodies, and we could hardly stop there on account of the terrible cadaverous odor which they exhaled, men as well as horses: we were too the cause of a rising up from the bodies of a great number of large flies gendered by the moisture of the bodies and the heat of the sun; they had green and blue bellies and when they were in the air they cast a shadow on the sun. It was wonderful to hear them buzzing and wherever they settled they made the air pestilent and there they caused the pest."

Verbatim: "Nous fusmes cause de faire eslever de ces corps une si grande quantité de grosses mouches, qui s'estoient procreés de l'humidité des corps morts et de la chaleur du Soleil, ayans le cul verd et bleu, qu' estans en l'air faisoient ombre au Soleil. On les oyoit bourdonner à grand merueille, et croy qua là on ils s'assirent, c'estoit pour rendre l'air pestilent, et y cause la peste."

The value and completeness of the observation of this great surgeon is fully appreciated when we consider how short a step it is necessary to take in order to make a practical application in the prevention of the infection thus distributed by flies, whether by inhumation or incineration of the dead bodies or by the use of screens to protect the living.

What benefits might not have accrued to humanity during the past two and a half centuries had some inquiring mind

gone to work to submit this magisterial dictum to a few simple practical tests!

In the year 1668, after a severe visitation of the plague a distinguished natural philosopher, a Jesuit priest named Athanasius Kircher (Scrutinium physico-medicum Contagiosae Luis, quae Pestis dicitur etc. Romae 1658, p. 145), in writing of the causes of the plague—"De mirandis contagii sive fomitis pestiferi effectibus, et quaenam res contagii capaces sint," says under the remarkable caption "muscae pestis Seminatives," including bees as well as diptera under the title "musca," "Last of all flies according to Mercurialis, saturated with the juice of the dead or of the diseased then visit neighboring houses and infect the food with their filth. A hornet lit on the nose of a certain nobleman in the late Neapolitan plague, who was looking out of the window, and stung him and in two days he was dead."

My next claimant for honors is also a Frenchman, G. Déclat, a man of great ability born both too early and too late, too late to be recognized as the discoverer of antisepsis, for that honor belongs to his quondam friend and competitor Lemaire, but too early for recognition of his merits by the world at large, for his work still had to await another generation to find suitable recognition and approval.

Déclat writes, in his work entitled "Nouvelles Applications de l'Acide Phénique en Médicine et en Chirurgie aux Affections Occasionnées par les Microphytes—les Microzoaires—les Virus, les Ferments," etc., Paris, Oct., 1865:

"De l'acide Phénique dans les cas d'emploisonnements transmis par les insectes.

Dans notre climat nous n'avons pas de mouches réellement venimeuses, c'est-à-dire qu'une piqûre de mouche seule ne suffit pas pour amener des accident graves, quelle que soit la partie du corps qu'elle pique. Ainsi, la piqûre des abeilles, des guêpes, des frelons ne peut entraîner que la douleur ou un peu d'enflure plus ou moins considérable, selon la nature des tissus atteints par l'insecte. Mais si la mouche n'occasionne pas d'accidents graves par sa piqûre proprement dite, elle peut cependant être la cause indirecte de désordres qui entraînent quelquefois la mort.

L'explication en est facile, et c'est cette explication qui nous donnera la clef des moyens propres à nous en préserver:

Les mouches touchent à tous les corps et de préférence aux corps végétaux ou animaux qui sont en décomposition. Or, la décomposition n'est autre chose que la désorganisation par les ferments, par ces êtres microscopiques, dont le but dans la nature est de détruire tout ce qui a vécu, tout ce qui vit et tout ce qui vivra. La mouche transporte souvent, au moyen de ses pattes, de ses ailes, de sa trompe ou de ses mandibules une quantité plus ou moins grande de ces êtres destructeurs. Si elle se pose sur un être vivant, et que la partie de son corps empreinte du virus contagieux touche la peau de cet être vivant à l'endroit d'une écorchure, quelque petite qu'elle soit, elle y dépose ce ferment, et peu à peu il pénètre à travers l'écorchure ou l'éraillure de la peau, se mêle au sang, et devient le point de départ de tous les accidents auxquels donne lieu la pénétration de ces êtres dans le sang, où ils se multiplient.

Si l'ensemble de ces circonstances ne se présente pas plus souvent, on doit s'en étonner, car les mouches recherchent toujours les parties dénudées de notre corps et se placent de manière à pouvoir pomper un liquide qui leur serve d'aliment; or elles le puisent dans le fond des pores, dans les parties fines de la peau, le pourtour des yeux, par exemple, et surtout dans les écorchures, dans les éraillures, les coupures, les boutons, etc. Si les accidents ne sont pas plus fréquents, c'est que la loi organique qui défend les viscères et maintient la vie, comble rapidement les fissures de la peau par la sécrétion d'une matière coagulable à l'air. Et, dès lors, la mouche, quoique se plaçant sur ces parties, y dépose bien un principe dangereux, mais par bonheur ce principe ne peut pénétrer que bien rarement.

Par une prévoyance providentielle, les mouches armées de telle sorte qu'elles peuvent attaquer la peau, sont moins portées que les autres à se nourrir de matières septiques; sans cela, comme elles font elles-mêmes une porte d'entrée, soit avec un aiguillon, soit avec des mandibules, elles feraient pénétrer avec leur venin le germe des infucoires mille fois plus dangereux que ce qu'elles peuvent déposer elles-mêmes.

Le danger réel vient donc surtout du contact des mouches qui ne piquent pas, et cela parce qu'on ignore ce danger qui nous menace et qu'on ne le soupçonne qu'après les premiers symptômes de gonflement, de malaises ou des maux de coeur, et quelquefois il est déjà trop tard, comme cela arrive si souvent dans la *pustule maligne*. Par quel moyen donc se préserver de ce danger qui est réel?

Le premier et le meilleur serait de ne jamais laisser à l'air libre un corps en décomposition, d'enterrer toujours assez profondément les cadavres des animaux, surtout lorsqu'ils sont morts de maladies douteuses, de ne jamais les jeter dans les rivières, dans les fleuves et encore moins dans les eaux stagnates; le second est d'avoir toujours chez soi et encore mieux sur soi, pendant l'été, un flacon d'acide phénique. L'action de cet acide est précieuse et rapide dans ces circonstances: comme preuve, je citerai une observation que j'ai recueillie tout récemment."

What could be clearer than these simple lines? All that is wanting is the vigorous scientific experiment to prove the absolute correctness of the observations for he says:

a. The fly visits bodies in process of decomposition.

b. Decomposition is nothing more or less than destruction by ferments which are living microscopic structures.

c. The fly transports on its feet, its wings, its proboscis, or its mandibles, some of these destructive agents.

d. This material is carried to and deposited upon the living body, where, if there is any abrasion, or fissures or any solution of continuity whatever, the contagious virus does its work by entering the vascular system and multiplying indefinitely.

What more could one ask? Perhaps the recognition of the different species of microörganisms and a few modern experiments to prove the thesis. But one must leave at least a little ground for subsequent workers to cultivate!

THE FIFTIETH ANNIVERSARY OF THE INVENTION OF THE OPHTHALMOSCOPE.

BY HARRY FRIEDENWALD, A. B., M. D.

(Read before the Historical Club of the Johns Hopkins Hospital, March 11, 1901.)

It is just 50 years since the ophthalmoscope was invented. It seems proper to make reference to an event of such importance before your Historical Society and I have thought that it would interest you to spend a little time on a review of the origin and development of the instrument. It is of special interest to consider the gradual accumulation of facts and observations, the building stones which were required before even the genius of a Helmholtz could rear his structure. The most important of these was the observation of the luminous appearance of the pupil, which I dare say all of you have often seen in animals and human beings. It was easy for us to make the observation because the fact had been pointed out. But most of us are very poor observers and generations and generations of common people, of learned men, of practitioners of medicine and of ophthalmologists came and went and yet the observations bearing upon this fact stand out as a few isolated instances throughout the centuries.

The ancients observed the luminosity of the eyes of certain animals for there is doubtful mention of it by Aristotle, and Pliny says "the eyes of nocturnal animals, such as cats, are brilliant in the darkness." Similar observations were later on made in the dog, horse, sheep, weazel, hyena and the birds of prey.

The first mention of the observation in the human eye was made in 1796 by Fermin who saw that the pupils of an Ethiopian Albino were luminous. Other cases were published, as rare and curious, during the first quarter of the 19th century and some went so far as to state that the light radiating from such eyes illumined the objects on which it fell and enabled the fortunate individual to read in the dark. The bright yellow appearance of the pupils in certain forms of disease, first mentioned by Scarpa in 1816, was classically described by Beer in 1817 under the title of "Amaurotic Cat's Eye."

We find no mention of luminosity in other than albinotic or diseased eyes until 1837 when Behr observed it in a case of total iriderimia and it was not until the forties before the observation was made on normal eyes.

It is interesting to learn the theories that were offered to explain these observations. First it was regarded as a phenomenon of phosphorescence, by some as the light absorbed during the day and given off at night and later by others as the result of an internal activity similar to that of the fire-fly. It was described as varying with the seasons, with the age of the individual and with his nervous state. Electricity was also called upon to assist in explaining the luminosity of the eye. It was the "naked electricity emitted by the retina, for nowhere in the animal organism is the brain substance exposed to the naked eye as clearly as in the open interior of the eyeball" (Pallas, 1811).

But Prevost in 1818 pointed out the true cause—the reflection of the light which entered the eye, and Gruithuisen about the same time came to a similar conclusion. In 1821 Rudolphi added the observation that success of the experiment depended upon having the light thrown in, in a definite direction and that the eyes of the decapitated head of a cat were as easily made luminous as in the living.

Esser in 1826 showed that such eyes show even brighter than the living because of the larger size of the pupil, and Johannes Mueller reached a similar conclusion. In 1836 Hasenstein showed that he could make the pupil luminous by compressing the eyeball in its anteroposterior diameter, and in 1845 Bruecke gave the correct explanation of the red color of the luminous pupil in that the light was reflected by the choroidal blood-vessels.

In the following year a most important communication by Cumming in Med. Chir. Trans. was made. He showed that every healthy human eye can be made luminous. The person is placed at a definite distance from a light, this distance varying with the intensity of the light and the observer places himself close to the straight line between the course of light and the eye examined. He showed that the luminosity of the pupil varied with the intensity and the distance of the light and that when the distance was decreased to a few inches it vanished because the light is cut off by the head. He reported a number of cases, in one of which only could he not produce the luminous appearance. In this case the pupils were very small. It was Cumming who first suggested and used this method for examination of the posterior portion of the eyeball, making the endeavor to draw conclusions concerning the retina as well as the media from the conditions of the reflex.

About this time Bruecke's attention was directed to this subject by accidentally observing a young man's eyes become luminous, and in 1847 he invented independently the same method as that of Cumming. He also mentioned an observation of Erlach that eyes could be made luminous by the bright light reflected from his concave spherical spectacle glasses, a fact which Bruecke substantiated by experiments with others.

To return a moment to another aspect I must point out that as early as 1704 Mery observed that the fundus of cats' eyes became distinctly visible when the animal was placed under the water. La Hire explained this phenomenon five years later: "When a normal eye is in the air the rays of light issuing from a point in the fundus are so refracted that they leave the eye in parallel lines. For this reason we should be able to see the point in the fundus clearly, for parallel or almost parallel rays always produce a distinct perception in our eye; nevertheless, we do not see the object. On the other hand, when the eye is under water the

rays leaving the eyeball diverge and in passing from the water into the air they are made to diverge still more. The result is that wherever we place our eye these divergent rays give us a clear picture of the point in the fundus from which they emerge." He does not attempt to explain the problem why the parallel rays emerging from an eye exposed to the air cannot be seen.

La Hire's profound statement was too advanced, others receded from it and it required almost 150 years before the problem was solved.

In 1851 a little pamphlet was published by Helmholtz, then a young professor of anatomy and physiology in Koenigsberg, under the title of "Beschreibung Eines Augen-Spiegels zur Untersuchung der Netzhaut im Lebenden Auge."[1] In this he demonstrated the fundamental fact that the *rays pass out of the eye in the same lines in which they have entered.* He explains Cumming's and Bruecke's observations as being due to the fact that the eye is not exact focus for the light and thus rays pass out by lateral dispersion. But what was most important, he added the *practical* to the *theoretical* and described an instrument with which the details of the retina could be examined. He described the ophthalmoscopic appearance of the retina, calculated the enlargement under which it is seen, pointed out the value of the instrument as a measure of the refraction and of the accommodative changes of the eye. He called attention to the important physiological observation that fibres of the optic nerve are insensitive to light. His short monograph was thorough and complete and gave into our hands a means of examination of which no one had yet dreamed.

In his modest way Helmholtz thus prophesies its usefulness. "I do not doubt, judging from what can be seen of the state of the healthy retina, that it will be possible to discern all its diseased conditions, so far as these, if seated in other transparent parts, such as the cornea, would admit of diagnosis by the sense of light. Distention or varicosity of the retinal vessels will be easily perceptible. Exudations in the retinal substance or between the retina and choroid, will be seen precisely as in the cornea, by their brightness upon a dark ground. Fibrinous exudations, usually much less transparent than the ocular media will, when lying upon the fundus, considerably increase its reflection. I believe also that turbidity of the vitreous body will be determined with greatly increased ease and certainty. In brief, I do not consider it an overstrained expectation that all the morbid changes of the retina or of the vitreous body that have been found in the dead subject will admit of recognition in the living eye; an expectation that appears to promise the greatest progress in the hitherto incomplete pathology of the organ."

How peculiarly applicable are the lines of Weir Mitchell:

> "How keen the wind thrill of delight
> When some new sun illumes our lessening night,
> And problems, dark for many a weary year,
> Shine, simply answered—luminous and clear."

[1] From certain statements in Michaelis' Life of v. Graefe (Berlin, 1877, p. 34) it would appear that the invention was really made in 1850.

The invention of this instrument ushered in a new era in ophthalmology the most important and the most prolific era in the history of this science. The influence it has wielded upon other branches of medicine is far-reaching. It will not be out of place to tell the story of the invention of the instrument in Helmholtz's words: "I was endeavoring to explain to my pupils the emission of reflected light from the eye, a discovery made by Bruecke, who would have invented the ophthalmoscope had he only asked himself how an optical image is formed by the light returning from the eye. In his research it was not necessary to ask it, but had he asked it, he was just the man to answer it as quickly as I did and to invent the instrument. I turned the problem over and over to ascertain the simplest way in which I could demonstrate the phenomenon to my students. It was also a reminiscence of my days of medical study that ophthalmologists had great trouble in dealing with certain cases of eye disease, then known as black cataract. The first model was constructed of paste-board, eye lenses, and cover glasses used in the microscopic work. It was at first so difficult to use that I doubt if I should have persevered, unless I had felt that it must succeed; but in eight days I had the great joy of being the first who saw before him the human living retina."

Helmholtz called his instrument "Augenspiegel" which was at first rendered into English as "eye speculum." The term ophthalmoscope, as Hirschberg wittily says "was given to the *German* instrument in *France* by a *Greek*" (Anagnostakis, 1854). The name ophthalmoscope has likewise been applied to an invention of Cramer for studying the lenticular reflexes, afterward called phacoscope by Donders. You will find the term ophthalmoscopy in the older works (Himly Desmarres, Wharton-Jones) to signify the examination of the eye for the purposes of diagnosis.

Passing from the name to the instrument itself it may not be superfluous to say a few words in the way of description, for the instrument has now become very rare. You see that it consists of a little metal chamber closed in front by several plates of glass set at an angle. In the back there is a space for the insertion of spherical lenses. The instrument is adapted only for close work, for what is known as the direct method, by means of which the fundus is seen in upright image. As such it is a perfect instrument optically speaking and it has been employed for some of the best work ever done.

It is interesting to learn how the instrument was received. In Germany it immediately attracted attention. Graefe was one of the first to recognize how invaluable it would be. His biographer Michaelis tells us that "when he first saw not only the red reflex but also the individual parts of the fundus, his eyes sparkled, his cheeks became flushed and he exclaimed enthusiastically 'Helmholtz has opened a new world to us'—and then he thoughtfully added 'how much there will be to discover there.'" Arlt procured an instrument immediately but he tells us in his autobiography that he had great difficulty in mastering it. Ruete, Donders, Coccius,

Stellwag and a great number of others busied themselves with it and soon added important contributions.

In France it was likewise taken up eagerly and Leber tells us that it was so highly thought of that a Frenchman spoke of it "as a German invention that was so beautiful that it deserved to have been made by a Frenchman."

The earliest mention that I can find in English literature is an account in the Monthly Journal of Medical Science in July, 1852. W. R. Sanders here describes Helmholtz's eye speculum and the Donder's Epken's modification. An excellent article appeared in October, 1854, in the British and Foreign Medical Review, by Wharton Jones. In this he reviews the original contribution of Helmholtz and those of Ruete, Coccius, Anagnostakis Van Trigt, and Eduard Jaeger. It is here likewise that he mentions the following interesting account: "It is but justice that I should here state however that seven years ago Mr. Babbage showed me the model of an instrument which he had contrived for the purpose of looking into the interior of the eye. It consisted of a bit of plain mirror, with the silvering scraped off at two or three small spots in the middle, fixed within a tube at such an angle that the rays of light, falling on it through an opening in the side of the tube were reflected into the eye to be observed and to which one end of the tube was directed. The observer looked through the clear spots of the mirror from the other end. This ophthalmoscope of Mr. Babbage we shall see is in principle essentially the same as those of Epkens and Donders, of Coccius and of Meyerstein, which themselves are modifications of Helmholtz."

What a pity that Babbage did not devote a little more time to this invention; he could hardly have missed being the inventor of an instrument whose value is a thousand times greater than that of all the calculating machines ever invented.

The earliest account of the ophthalmoscope in America is the review of Sanders mentioned above, and reprinted in the American Journal of Medical Sciences, July, 1853. One of the earliest accounts and one especially interesting to us is the report given by the committee on surgery (Drs. Christopher Johnson, Richard McSherry and Joseph Wilkins) to the Medical and Chirurgical Faculty of Maryland on June 7, 1854. The writer (probably Christopher Johnson), gives an account of the subject, far from good—but we are interested in learning that he "experimented with Helmholtz's speculum in Berlin with von Graefe, in Paris, with Desmarres, and in Baltimore, with Prof. G. W. Miltenberger." He illustrates the paper with colored drawings—which had better been left out.

Let us now take up the modifications of the instrument. The first was by Donders and Epkens in Holland in the same year, 1851, in which Helmholtz's publication appeared. The modification consisted in using a plain silvered mirror in place of the plates of glass.

As mentioned before, Helmholtz's instrument was adapted only for the upright method. In 1852 Prof. C. G. Theod. Ruete of Goettingen published a short paper in which he described the following modification: He replaced the plates of glass as reflector by a perforated concave silvered mirror about three inches in diameter and examined the eye from a distance, placing concave and preferably convex spherical glasses before the eye examined. In this way he obtained an inverted image of the fundus and thus it was he who practically introduced the important method of examination known as the indirect method.[2] This method reveals the fundus much less highly magnified, but it has the advantage of giving a much larger field, and in this way it supplements the direct method in much the same way as the examination with high and low powers of the microscope supplement each other. Ruete's invention is really the only important addition that has been made to Helmholtz's method and it is therefore one which deserves special praise. Ruete described a few pathological cases examined by means of his instrument; these so far as I am aware are the first on record.

His publication called out a second paper by Helmholtz, entitled "Ueber zine Neue Einfachste Form des Augenspiegels," in Vierordt's Archiv, 1852, p. 827.

In this article Helmholtz thoroughly explained the optical principles upon which Ruete's method depended and then he described his simplest form of ophthalmoscopic examination which required only a candle and a strong convex lens. The observer's head is placed close to the candle but shaded from it and the lens held near the eye examined. This, and Ruete's method he showed were practically identical. He also mentioned an addition to his instrument by the celebrated instrument maker of Koenigsberg, Rekoss. The insertion of correction glasses in the old instrument was tedious and annoying. Rekoss placed two discs which had lenses in their periphery in the same instrument; by turning these the lens desired could be obtained.[3] This device, the Rekoss disc, has been used in most modifications of the instrument.

In 1853 Coccius invented a modified instrument which for a time was very popular; it was von Graefe's favorite. It consisted of a plain mirror upon which the light thrown through a convex spherical glass attached to the instrument.

None of these instruments, however, equaled in usefulness the one described the following year by Eduard Jaeger. This was essentially a Helmholtz instrument in which there were two reflectors, one composed of plates of glass, like Helmholtz's, the other a concave mirror; the former was used for the direct, the latter for the indirect method of examination.

The invention of new forms of ophthalmoscopes now be-

[2] In his original communication Helmholtz discusses the possibility of using convex lenses and obtaining an inverted image. He used two convex lenses, one placed in the position usually taken by the concave lens in the back of the ophthalmoscope, the other at a distance which was less than the sum of the focal distances of the two lenses. The latter lens was close to the eye of the observer. This method was very impracticable and differs essentially from that of Ruete in that the mirror is placed between the collecting lens and the observed eye.

[3] Each disc contained four lenses, one those from 6 in. to 9 in., the other those from 10 in. to 13 in., all concave.

came a favorite employment of ophthalmologists. As mirrors, we find the following:

1. Plates of glass as in Helmholtz's instrument.

2. Plain, concave and convex mirrors of silvered glass or of polished metal with central opening.

3. Plain and convex mirrors upon which light was thrown through convex spherical glasses.

4. Prisms.

5. Concave and convex spherical glasses, acting at the same time as correcting glass and as reflector. These were known as Heterocentric. If other reflecting surfaces could have been found they doubtless would have been used.

Next the inventive genius of ophthalmologists devised methods of combining the parts, the illuminating lens and the mirror, the mirror and the collecting lens required for the inverted method; and finally instruments were constructed in which all the parts were more or less fixed, the so-called stationary ophthalmoscopes.

Then again it was found necessary to have a greater number of correcting lenses in the ophthalmoscope, in order to measure the refraction more accurately and a legion of inventions appeared in which one, two or three Rekoss discs or combinations of such discs were employed to give the requisite array of intervals. The most ingenious of these is the well-known instrument of Dr. Loring, who at one time practised in this city.

Finally, Cooper invented an endless chain of lenses to replace the Rekoss disc and thus freed himself from the limitations of a wheel which could not be made very large and therefore could not contain many lenses unless they were made exceedingly small. The popular instrument of Morton is a modification of this.

The endeavor of late years has chiefly been in the direction of lighter instruments and more convenient ones.

I must not omit to note that a number of ophthalmoscopes have been constructed in which the source of light is a small electric light within the instrument. Mention should also be made of a number of ingenious methods for the determination of refraction by the inverted method. But I dare not spend any time in considering these here.

However, there is one subject, the use of the ophthalmoscope for skiascopy or the shadow test, which I dare not pass over. The phenomenon upon which it is based was first observed by Bowman, later by Cooper and was developed by Cuignet and Parent. As a method for the objective determination of refraction it is of high value.

It is hardly necessary to ask what has been accomplished by means of this invention of Helmholtz. The answer would be: All that Helmholtz prophesied and much more. What has become of that great category of diseases known as amaurosis, conditions defined by Philipp von Walther as those in which the patient saw nothing—and the doctor nothing too? In Ruete's Lehrbuch published in 1853 I find 37 varieties of amaurosis, few of the names are intelligible. In their place we now find the many varied diseases of the retina, of the optic nerve and of the choroid.

It was found that not only were there many varieties of retinitis, neuritis and choroiditis, as well as degenerative processes of the same tissues, but that these changes were often more or less characteristic of different constitutional and organic diseases, such as nephritis, diabetes, syphilis, etc., of leucemia, of cardiac and general vascular disease.

In consequence an important subject developed—that of the relation of ophthalmology to general medicine, and the ophthalmoscope became an instrument of great service to the student of general medicine. Then again the diseases of the optic nerve were found to have important bearings on brain and spinal cord diseases and thus we find the old amaurosis cerebralis and the amaurosis spinalis replaced by the varieties of neuritis and of optic nerve atrophy, characteristic of tumors of the brain, of meningitis tabes dorsalis, etc. It is not surprising therefore that the ophthalmoscope became of supreme importance to the neurologist and that an enthusiastic Frenchman called the method of examination cerebroscopy (Bouchut). But nothing emphasizes this statement more strongly than that one of the best works on ophthalmoscopy was written by a neurologist (Gowers).

I should like to refer to the lessons which the ophthalmoscope has taught the pathologist in the study of embolism, of thrombosis, etc., but time will not permit.

There is one point which I dare not omit: the ophthalmoscope has been the means of making examinations of the eye accurate and through its means this branch of medicine has made a great step in advance toward that ideal, the elevation of medicine to an exact science.

It is necessary also to mention that the methods of examination of other parts of the body by means of mirrors as in otoscopy, rhynoscopy, etc., likewise owe their origin to Helmholtz. It is not generally known that in his original communication he especially mentions the use of the mirror for the examination of the nose and of the drum-head.

I shall conclude with an extract from an address by Helmholtz, delivered on the occasion when the Graefe medal was awarded him by the ophthalmic society of Germany (1886). This adds lustre to the invention through the modesty with which he regarded the part he played.

"Let us suppose that up to the time of Phidias nobody has had a chisel sufficiently hard to work on marble. Up to that time they could only mould clay or carve wood. But a clever smith discovers how a chisel can be tempered. Phidias rejoices over the improved tools, fashions with them his God-like statues and manipulates the marble as no one has ever done before. He is honored and rewarded. But great geniuses are most modest just in that in which they most excel others. That very thing is so easy for them that they can hardly understand why others cannot do it. But there is always associated with high endowments a correspondingly great sensitiveness for the defects of one's own work. Thus says Phidias to the smith 'without your aid I could have done nothing of that; the honor and glory belong to you.' The smith can only answer: 'But I could not have done it even with my chisels, whereas you, without my chisels

could at least have moulded your wonderful works in clay; therefore I must decline the honor and glory, if I will remain an honorable man.' But now Phidias is taken away, and there remain his friends and pupils Praxiteles, Paionios and others. They all use the chisel of the smith. The world is filled with their work and their fame. They determine to honor the memory of the deceased with a garland which he shall receive, who has done the most for the art, and in the art, of statuary. The beloved master has often praised the smith as the author of their great success and they finally decide to award the garland to him. 'Well,' answers the smith, 'I consent; you are many and among you are clever people. I am but a single man. You assert that I singly have been of service to many of you and that many places teem with sculptors who have decked the temples with divine statues, which without the tools that I have given you, would have been very imperfectly fashioned. I must believe you, as I have never chiselled marble and I accept thankfully what you award to me, but I myself would have given my vote to Praxiteles or Paionios.'"[4]

[4] At the conclusion of the above address a number of old ophthalmoscopes, including an original Helmholtz ophthalmoscope and a number of old publications were demonstrated.

THE FIRST NEPHRECTOMY AND THE FIRST CHOLECYSTOTOMY, WITH A SKETCH OF THE LIVES OF DOCTORS ERASTUS B. WOLCOTT AND JOHN S. BOBBS.

By Martin B. Tinker, M. D.,

Assistant Resident Surgeon, The Johns Hopkins Hospital.

As a rule, men of science and letters of all nations specially delight to honor those of their own countrymen who have added noteworthy contributions to the sum of human knowledge. In medicine, particularly, we see much of this pride in national achievement. To the loyal German student of medicine nearly everything worthy of mention seems to have been accomplished by Germans; the same is true of the Englishman and of the Frenchman. The American medical profession, however, seems to be somewhat of an exception to this rule. It is true that we are still young as a nation and have not yet had time to accomplish as great results as the older nations, but decidedly too little is known about that which has been already accomplished among us. We know too little of those whose achievements in most other countries would be well known to all their countrymen. The object of this paper is to bring to your attention some facts about two pioneers in American surgery whose names and work are not as generally known and honored in the American medical profession as I believe they deserve.

The first nephrectomy was performed by Dr. Erastus B. Wolcott, of Milwaukee, June 4, 1861. I am unable to find that he ever formally reported the operation, but the following account of the facts of the case are given by Dr. Charles L. Stoddard, of E. Troy, Wisconsin, in the Philadelphia Medical and Surgical Reporter for 1861-62, Vol. VII, page 126. The title is "Case of Encephaloid Disease of the Kidney. Removal, etc." With the exception of a few unnecessary details, I quote in full:

"On the 4th of June last I was invited to assist Dr. E. B. Wolcott, of Milwaukee, in the removal of a tumor from the abdomen of Mr. J., aged 58 years. On examination we found that the patient was a tall, anæmic looking man of a peculiar cast of countenance, indicative of serious organic disease. He stated that he was of healthy parentage, and had good health until the appearance of the tumor six years before that time. The physician in attendance stated that from the first appearance of the disease, some irritation of the urinary organs had existed, but what the deposits were we were unable to learn, as no reliable chemical or microscopical evidence was presented.

We found the tumor to be large, filling the right hypochondriac region and pressing the abdominal parietes forward about two inches from their natural level. On palpation it was evident that it was semi-solid, having a pedicular attachment, apparently to one of the sulci of the liver, with more extensive attachment to the posterior parietes.

Having no reliable data to form a diagnosis, other than the present state, after duly considering the patient's anxiety, and his deprivation of general health, we concluded that an operation offered the only chance of ultimate recovery; at the same time we stated to the patient and his friends that the operation was a serious one in his state of health. Our conclusion was, that we had here a cystic tumor of the liver, pressing on the kidney and producing irritation sufficient to account for the albuminous deposit. After the administration of chloroform, Dr. Wolcott proceeded to the removal of the tumor by making an incision diagonally across it down to the peritoneum, which we found to be very much thickened and slightly attached to it. He then proceeded to free it from its extensive posterior attachments, after which he found that the superior attachment was a very dense cord-like structure, about an inch in circumference, and apparently proceeding from the posterior part of the liver.

Carefully tying the pedicle, he severed this connection with a knife, and after removing foreign matter carefully from the abdomen, brought the edges of the wound together with common sutures and adhesive strips, which was the only dressing used. After the patient was free from the effects of chloroform, morphia and camphor were administered in sufficient quantities to quiet irritation and produce sleep.

The tumor weighed 2½ pounds, and on incising it freely, we found undoubted evidence of its being a kidney from a small portion of its upper portion, which had not degenerated, showing the tubules and a portion of the pelvis.

The patient lived 15 days after the operation, and died apparently from exhaustion, caused by the great amount of suppuration which necessarily followed."

It is interesting to note that as early as the 17th century nephrectomy had been done experimentally on dogs. In an article in von Pitha and Billroth's System of Surgery, Heinecke states that Zambeccarius in the latter part of the 17th century removed a kidney from a dog and the animal recovered. This was done after he had observed at dissections that some healthy dogs have only one kidney.

Blancard, of Amsterdam, in his "Lexicon medicum renovatum," published in 1739, also mentions experimental nephrectomy and believes that it might be performed on man.

ERASTUS B. WOLCOTT, M. D.,

Born October 18, 1804. Died January 5, 1880.

Simon, of Heidelberg, is generally credited with having performed the first nephrectomy, but his operation, reported in Deutsche Klinik, Berlin, 1870, was not performed until eight years after Wolcott's operation. Simon undoubtedly deserves greater honor for having done nephrectomy experimentally on dogs, for undertaking the operation deliberately, knowing what he had to deal with and for bringing the operation before the medical profession, but the honor of priority is in no wise due to him, for Wolcott's operation was performed in 1861, more than eight years previously.

Erastus B. Wolcott was born at Benton, Yates County, New York, October 18, 1804. He was fortunate in his ancestry, coming from a race of unusually intellectual and enterprising men and women. He was the son of Elisha and Anna Hull Wolcott, who came from Litchfield County, Connecticut, and were among the first settlers of that section of New York. The Wolcott family were from good old English stock. Henry Wolcott came to America in 1630, and his descendants in a direct line for over 180 years were among the most prominent of the colonists. Their names are found among the officers of the Colonial army, one was a signer of the Declaration of Independence, six were governors of the state of Connecticut, and there were many senators, representatives and several justices of the Supreme Court.

Dr. Wolcott's early life was like that of most children on the frontier in those days. Educational and social advantages were few, but the life of a frontiersman developed healthy bodies and minds. As a boy he attended the public schools, but I am unable to find that he had opportunities for higher education. In those days it was the custom for young men who desired to practise medicine to begin their studies with some practising physician, and Dr. Wolcott began the study of medicine and surgery with Dr. Joshua Lee, one of the most eminent men in his profession in central New York at that time. After three years' study with Dr. Lee, Dr. Wolcott received his qualification to practise medicine from the Yates County Medical Society in 1825. He was desirous of further study, and in order to earn money accepted a position as a surgeon to a mining company in South Carolina. He lived at the mines and in Charleston until 1830, when he returned to New York and attended the College of Physicians and Surgeons of the Western District of New York from 1830 to 1833, and from this institution he received the degree of Doctor of Medicine. In 1835 he took the examination for surgeon in the United States Army, and received his appointment January 1, 1836. He was stationed at Fort Mackinaw, where he met his future wife, Elizabeth J. Dousman, the daughter of a fur-trader at that post. He resigned his position in the army in 1839 and settled in Milwaukee, where he practised medicine for over forty years.

Personally, Dr. Wolcott was a man of remarkable physique. He was early noted for his great strength, and when a young man it is said that he could run and jump over a team of horses. He was also an expert shot with a rifle, shotgun or bow. His father came into the possession of an unusually strong bow once owned by the Indian chief Red Jacket. It is stated that very few white men could draw the bow to its maximum power, and not one in a thousand could use it skilfully. It is reported in the history of Yates County, New York, that Dr. Wolcott shot a blunt square-ended arrow through the siding of the first Methodist meeting-house of that county, at a distance of twenty rods. The church had been at that time abandoned. Dr. Wolcott retained his physical powers even to the time of his death. When seventy-five it is said that he could vault a five barred fence or shoot a pigeon on the wing as well as when a boy. During the last summer of his life he was called to a town at some distance to see a patient. He was desirous of reaching home as soon as possible and boarded a freight train which happened to be the first train going to Milwaukee. Finding that the train would be unavoidably delayed, he walked from the town, eighteen miles distant, to Milwaukee, and arrived some time

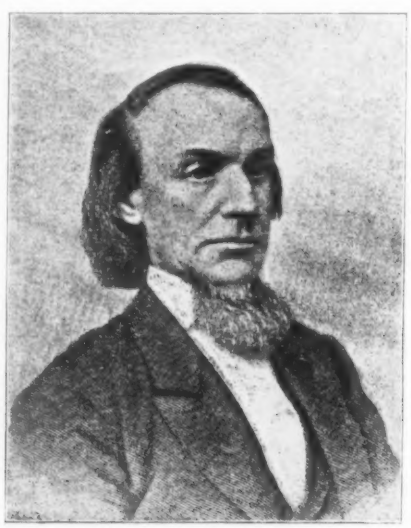
before the train. When he was asked why he did so he stated that he was in something of a hurry and that he wanted to see if he was really growing old.

He was a man of unusual strength of character and intellectual attainments and made up for the lack of a liberal education by a wide reading. All the records which we have of him specially mention his generosity. Nothing in the way of fatigue or hardship ever prevented immediate attention to a professional call, no matter what the financial standing of the patient might be. At the time of his death thousands of poor people gathered from the city and surrounding country to honor his memory, and the arcade in which he lay in state was choked by the middle and lower classes. His great professional ability and personal popularity brought him into many public positions. He was surgeon-general of the state of Wisconsin as early as 1842, which office he held during the Civil War and to the time of his death. He was a member of the Board of Regents of the state university, a manager of the Soldiers' National Home at Milwaukee, major-general of the state militia, trustee to the Wisconsin Hospital for the Insane and commissioner to the Paris Exposition. As a consulting surgeon he was well known throughout the Northwestern states, and he was frequently called long distances in critical cases as a consultant. Dr. Wolcott's surgical achievements were not limited to performing the first nephrectomy. Among other operations which he performed and about which I have received definite personal information were: excisions of the breast, trephining, thoracotomy, an extensive plastic for the scar of burns which had fixed the chin to the chest, oöphorectomy, Cæsarian section and many other major operations, some which were quite unusual in his day. It should be remembered that frontier surgeons of that day operated without the advantages of the modern, thoroughly equipped hospital, without the aid of trained assistants and not infrequently without any assistant; antisepsis was almost unknown and anæsthetics were just being introduced. The esteem in which he was held by his fellow citizens is shown by the fact that his funeral procession was led by six hundred veterans from the state of Wisconsin and that resolutions of sympathy were passed after his death by the Milwaukee Academy of Medicine, Milwaukee County Medical Society, and by numerous clubs and military associations. Several prominent medical men from the section in which Dr. Wolcott practiced have recently told me that they consider him the greatest surgeon the middle West has ever produced, and hundreds of people gratefully remember him as their benefactor and friend.

The first cholecystotomy was performed by John Stough Bobbs, of Indianapolis, Indiana, June 15, 1867. A report of the case may be found in the Transactions of the Indiana Medical Society for 1868. The chief features of the case are as follows:

A woman, 30 years of age, came to Dr. Bobbs in consultation with her physician. Four years previously she had noticed an enlargement in the right side which she stated was low down in the iliac region. Her health at that time was bad. She had pain and distress on taking food or drink or after exercise, which frequently continued three or four hours. The enlargement in her side continued to increase and soon became tender. Ultimately it prevented her from walking, and following January, 1867, the increase in size was more rapid and the trouble was greater. On examination a tumor was found in the right side which was tender to pressure. Its outline could not be well made out except on the right side, where it was quite distinctly defined. The tumor was slightly movable, and the abdomen was tense and slightly projecting. Vaginal examination disclosed no connection with the uterus or its appendages. The patient was exceedingly anxious to have something done for her relief. A diagnosis of probable ovarian tumor had been made by several physicians, but after observation for a considerable time the patient was informed that the true nature of the growth was uncertain and she was given no assurance that it could be successfully removed. The patient, however, persisted in her request that an operation should be undertaken, and an exploratory celiotomy was made by Dr. Bobbs, assisted by several local physicians. Under chloroform anæsthesia an incision was made between the umbilicus and the pubes. The omentum was found thickened and adherent to the abdominal wall. It was separated toward the right side in hope of reaching some part where no adhesions existed, but failing in this, the omentum was torn through over the tumor so as to admit the finger upon the protuberant portion of it. Passing the finger around the mass some adhesions were broken up and the tumor was traced upward. No pedicle or attachment could at first be definitely made out. The abdominal incision was then carried above the umbilicus on the right side over the prominent part of the enlargement. The mass was oval in form, tense and contained pellucid fluid. An incision was made into it and perfectly clear fluid escaped with considerable force, propelling several gall-stones about the size of an ordinary rifle bullet. On introducing the finger other solid bodies were felt, but not in the main sac. A number were hooked out with the finger from this sac. They varied in size from that of a mustard-seed to that of a bullet. No communication between this sac and the main sac could be found. The second sac had the appearance externally of a hydatid cyst, its walls were of the thickness of the skin, and its inner covering was smooth and whitish. Pulling it downward the right lobe of the liver was brought into view, to the lower surface of which the sac was attached by a broad linear base like the gall-bladder. At first there was some doubt as to whether the sac was really an enlarged gall-bladder, but this seemed to be definitely identified by its form, attachments and the concretions which it contained. The sac was then closed by stitches, the nature of which is not mentioned and the abdominal wound was sutured. At a dressing one week after the operation a stitch abscess was found which had given the patient some pain and discomfort for a few days after the operation. From this time, however, the patient's recovery was uneventful,

and at the end of two weeks she was permitted to sit up, and in three weeks she was about the house. A complete report is given of the progress of the patient from day to day, but the essential points have been noted. In an editorial article which appeared in the Indiana Medical Journal in October, 1899, it is stated that the patient is still living near Indianapolis, thirty-two years after the operation, and in answer to a letter of inquiry from the editor of the Indiana Medical Journal, she writes as follows: "My gall-bladder was opened; between 10 and 50 stones were removed; there was a partition dividing one from the rest and that one was left; the size of the stones was from a shot up to a pea. I was informed that the bladder was sewed up. As to the doctors present I can remember seven, but they have all passed out but one." The names of the doctors are mentioned and the letter closes with



JOHN S. BOBBS, M. D.,

Born December 28, 1809. Died May 1, 1870.

the statement that the patient still has some trouble, which she thinks is caused by the one stone which was not removed.

John Stough Bobbs was born at Green Village, Pennsylvania, December 28, 1809. I have been unable to find very much information about his early life or education. In a memoir by Dr. P. H. Jameson, published in the Transactions of the Indiana State Medical Society, 1894, it is stated that Dr. Bobbs was of Pennsylvania German descent. As a child he spoke the peculiar dialect of that section. He was a man well educated in the fundamental branches, he wrote English well and was a fluent speaker. He was also well versed in history, he had a good knowledge of the English classics, and had given some attention to philosophical writings. At the age of 18 he began to read medicine with Dr. Martin Luther, of Harrisburg. After this he attended one course of medical lectures and then located in Middletown, Pennsylvania, where he practised for four years. He located in Indianapolis in 1835, but took a course of lectures in Jefferson Medical College in Philadelphia the same year, graduating in the spring of 1836 after two courses of lectures and study with a preceptor as was required in those days. He soon took high rank both as a physician and surgeon. When the Medical College of Indiana was organized he was elected professor of surgery and later dean of the faculty. As a practitioner, one of his contemporaries states that there was less sham about Dr. Bobbs than any physician he ever knew. Up to the time of his death he had never been known to give a placebo in any case and his treatment was based upon rational lines. Once when called to see a patient suffering from an acute malady, he suspended all medical treatment, giving only stimulants and foods. When questioned about his course of treatment he said: "Why give medicine here without a reason or a purpose for it?" The patient recovered and was still living and well at last accounts. Dr. Bobbs believed strongly in an organized and united medical profession and labored faithfully with that end in view. He was first in the work of establishing the Marion County Medical Society in 1847, and he was prominent in helping to organize the state society of Indiana in 1849. In both societies he was an active and prominent member. In 1868 he was elected president of the Indiana State Medical Society. His inaugural address was upon "The Necessity of a State Medical Journal and a Medical College." His paper on lithotomy of the gall-bladder, from which my report of the operation is taken, was published in the same volume of the transactions with his presidential address. The latter part of Dr. Bobb's life was devoted mainly to surgery. He was well read in the literature of his specialty, and as an operator he was bold and original. Like most of his contemporaries, he was not a frequent contributor to medical literature. Dr. Jameson, in the paper which I have quoted, mentions an operation in which he assisted, in which Dr. Bobbs removed the superior maxillary bone together with the eye of the affected side for extensive carcinoma. The operation lasted several hours, but the patient made a good recovery. The hæmorrhage was so well controlled that little blood was lost and the patient recovered from the operation and was much more comfortable afterward. He also mentions a successful operation for extra-uterine pregnancy and an unsuccessful operation for umbilical hernia. Dr. Bobbs was a brigade surgeon during the Civil War, and in the latter office he was medical director for the district of Indiana. During the Civil War he was with the staff of General Morris, of Indianapolis, and showed his courage by bringing off the field under fire a soldier who was fatally wounded.

Besides his professional services, Dr. Bobbs was a public-spirited man who took an active part in the affairs of his city and state. For one term he served as state senator. He was one of the original commissioners who organized the Indiana Hospital for the Insane, and he gave liberally to general charitable purposes. In person he was slender, of medium height with striking features. His forehead was high, his

eyes dark grey, his nose large and aquiline, his chin prominent. He generally wore a suit of black broadcloth and a silk hat, and had the manners of the old-style gentleman.

He may be truly considered one of the founders of scientific medicine and surgery in the middle West. As the greatest general surgeon and teacher of his day in that section of the country, as a public-spirited man and soldier, his name will long be remembered in the region in which he practised.

Several others besides Bobbs did valuable pioneer work in gall-bladder surgery, but there is no evidence that I have been able to find that any one, at an earlier date, ever opened the gall-bladder after celiotomy.

Johannes Fabricius is credited with having opened the gall-bladder and removed stones from it as early as 1618. Fabricius Hildanus refers to this in his "Observations chirurgiques," published in Geneva by P. Chouët in 1669, but there is no evidence which would lead us to believe that this was an operation performed on a living person.

Among the older surgeons, Jean Louis Petit did most to clear up the symptomatology of the diseases of the biliary passages and to differentiate between these and intra-abdominal suppurative affections. In the Memoirs de l'Academie Royal de Chirurgie, Paris, 1743, Vol. I, p. 155, he mentioned three cases in which the gall-bladder was incised by mistake as an abscess, one of the patients recovering. From post-mortem study of several patients that died of the results of gall-bladder disease, he decided that the recovery in this case was due to adhesions to the abdominal wall. He advised lithotomy of the gall-bladder in cases in which it seemed likely that such adhesions were present, provided the patients were extremely ill and in danger of death, but he does not mention having performed any operation which can be properly classed as a cholecystotomy. Numerous others advised and performed tapping, and several recommended abdominal section, suturing the gall-bladder to the abdominal wall and opening after several days, but no one seems to have performed the operation.

Some will be inclined to criticise the claims to the honor of priority for the two men because the operations were undertaken without a knowledge of the conditions later found. But I would like to ask, what person who has seen many operations has not seen some of the best surgeons obliged to change their diagnosis after opening the abdomen? Because Columbus set out with a purpose quite different than the discovery of a new continent, because he died without appreciating the importance of his discovery, is he any the less the discoverer of America? Both Wolcott and Bobbs were experienced surgeons, accustomed to perform all the usual major operations of the surgery of their day. Both opened the abdomen uncertain what they would meet, but perfectly understanding that the conditions they had to deal with were most grave. Both met their difficulties and coped with them successfully for the first time in the history of surgery so far as we can learn. While we concede to Simon and to Sims, Tait, Richter and Robson the honor of placing the operation of nephrectomy and the operation of cholecystotomy on a firm and scientific basis recognized and acknowledged by our profession, can we Americans afford to let the names of these two fellow-countrymen go unnoticed?

MEASUREMENT OF THE EXTERNAL URETHRAL ORIFICE.

BY G. BROWN MILLER, M. D.

The diameter of the lumen of the female urethra is given by Gray and Quain as one-fourth of an inch. Billroth and Luecke and others estimate it at 6-8 mm. So far as I can learn, no estimate based upon a large number of cases has ever been made. For the purposes of cystoscopic examination, catheterization of the ureters and the like, it is important to know what is the largest cystoscope which can be introduced without causing injury to the urethra. It has been found by Dr. H. A. Kelly that in such procedures the greatest resistance met with in the introduction of the speculum is at the external urethral orifice, and that in a normal urethra when the speculum passes this point it can be pushed into the bladder without further resistance. In dilatation of the urethra within moderate limits practically all of the laceration which occurs takes place at the meatus urinarius. It was, consequently, thought important to get accurate measurements of the diameter of the external urethral orifice. This was done in the gynecological wards of the Johns Hopkins Hospital in 100 cases. The instrument used was the urethral calibrator (Fig. 1), described by Dr. Kelly in the American Journal of Obstetrics, Vol. XXIX, No. 1, 1894. The method as described by him is as follows: "I calibrate the meatus urinarius by means of a slender metal cone, which is 10 cm. long and marked in a graduated scale from the point (2 mm.) to its other end (20 mm.) in diameter. The

FIG. 1.

calibrator is pushed into the meatus as far as it will readily go and the marking of the meatus is noted."

I give here in a tabulated form 100 cases taken without reference to their gynecological ailment and give their age, disease, number of labors, and the measurement of the vaginal outlet. In glancing over the table one will be struck with the large number of cases operated upon for laceration of the perineum or relaxation of the vaginal outlet. This is accounted for by the fact that the measurements were taken, as a rule, only in those cases where the external genitalia had been thoroughly cleansed as preparatory to operation. In cases of abdominal section the measurements were frequently

neglected. As seen from the table, this does not, to any noticeable extent, change the average. The smallest urethral orifice (4 mm.) was found in a woman who had borne eight children and who was suffering from carcinoma of the cervix. The largest urethrae, two in number (12 mm.), were found likewise in multiparous women. While the average diameter of the external urethral orifice in nulliparous women was practically the same (7.8 mm.) as in women who had borne

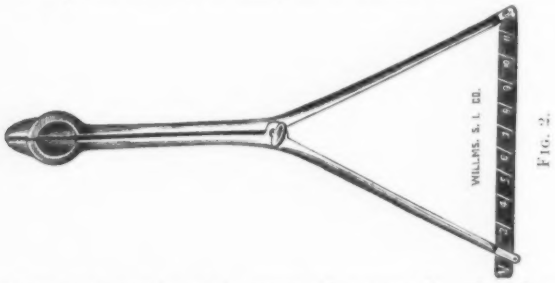


Fig. 2.

children (7.6 mm.) yet in cases of extremely relaxed vaginal outlet or prolapsus of the uterus, it was found, as could have been expected, that the meatus was larger than in those cases where this relaxation did not occur.

The measurements of the vaginal orifices were made by means of the vaginal calibrator (Fig. 2), also devised by Dr. Kelly. The cut will explain the working of the instrument. It consists of two slender metal bars crossing each other and working on an axis in their middle. At one end each has a narrow curved plate and the measure is at the other end. The plates are introduced into the vagina and separated by gentle pressure, and the scale measures the diameter of the gently dilated vaginal orifice. Below is the table.

TABLE.

Age Yrs.	No. of Labors	DISEASE.	Diam. of Urethra Mm.	Meas. of Vag'al Outlet. Cm.
37	2	Prolapsus Uteri	7	6.5
36	8	Relaxed Vag. Outlet	7.5	6.5
41	3	Descensus Uteri	6	6
24	1	Relaxed Vag. Outlet	8	6.5
35	2	" " "	8	8
29	1	" " "	7	4.5
23	3	" " "	9	6
33	4	Pelvic Inflammation	6	6
35	3	Endometritis	8	6
22	1	"	8	6
35	5	Descensus Uteri	8	6
38	6	" "	9.75	7
25	0	No Gynecological Disease	8	3
..	1	Relaxed Vag. Outlet. Retrofl. Uteri	8.25	5
35	2	" " " " "	8.5	8.5
32	3	Rupture of Recto-Vaginal Septum	6	6
38	2	Relaxed Vag. Outlet	7	5
28	3	" " " Retrofl. Uteri	8	6
21	2	" " " " "	5	6
47	6	Prolapsus Uteri " "	11	7
37	7	R. V. O., Retrofl. Uteri, Ovar. Cyst	7	6.5
23	2	Relaxed Vag. Outlet	7	6
37	3	" " " Retrofl. Uteri	6	6
32	2	Relaxed Vag. Outlet	8	6
35	8	Carcinoma Cervicis Uteri	4	..
32	6	Relaxed Vag. Outlet	12	7
32	2	Rupture of Recto. Vaginal Septum	4.5	5
34	1	Retrofl. Uteri, Relaxed Vag. Outlet	6	..
34	7	" " " " "	6	6

TABLE—*Continued.*

Age Yrs.	No. of Labors	DISEASE.	Diam. of Urethra Mm.	Meas. of Vag'al Outlet. Cm.
22	0	Endometritis	6	4
24	0	Retroflexio Uteri	10	..
29	4	Relaxed Vag. Outlet	8	5
30	1	" " "	8	5
26	3	" " " Retrofl. Uteri	7.5	5
20	0	Retroflexio Uteri	8.5	..
20	0	Pelvic Inflammation	7	..
17	0	Dysmenorrhoea	6	..
26	0	"	9	3.5
53	9	Syphilis	7	5
31	1	Retrofl. Uteri. Relaxed Vag. Outlet	8	5
29	0	Pyosalpinx	8	4.5
63	8	Relaxed Vag. Outlet	7	6
56	6	" " " Hemorrhoids	7	5
37	4	" " " Retrofl. Uteri	7	6
35	1	Laceration of Cervix	7	2.5
28	6	" " R. V. O. Retrofl. Uteri	8	6
34	3	Relaxed Vag. Outlet. Retrofl. Uteri	8	5.5
29	1	" " "	8	5
25	6	" " "	7.5	4
30	1	" " " Retrofl. Uteri	8	5
37	8	" " "	8	6
36	1	Myoma Uteri	7.75	8
40	4	Relaxed Vaginal Outlet. Retrofl. Uteri	8	8
23	1	Rupture of Recto-Vaginal Septum	6	4.5
24	2	Relaxed Vag. Outlet. Retrofl. Uteri	8	5
38	4	" " " Hemorrhoids	6	6
43	3	" " " Retrofl. Uteri	6	5
29	3	" " " " "	8	6
27	1	Myoma Uteri. Retained Secundines	6	5.5
18	0	Dysmenorrhoea	8	3.5
39	9	Relaxed Vag. Outlet. Retrofl. Uteri	5	8
52	10	Prolapsus Uteri	6	8
29	1	Relaxed Vag. Outlet	6.5	6.5
24	1	" " "	9.5	3.5
27	4	" " " Retrofl. Uteri	7	6
23	3	" " " Laceration of Cervix	12	6
38	2	" " " Retroversion of Uterus	7	6
39	4	" " "	6	5.5
52	0	Hemorrhoids	8	3
34	5	Relaxed Vag. Outlet	9	5.5
38	0	Dysmenorrhoea	8	3
20	0	Pelvic Inflammation	8	3
47	0	Appendicitis. Retrofl. Uteri	9	4.5
35	4	Relaxed Vag. Outlet	8	6
32	0	Dysmenorrhoea	6	..
32	1	Relaxed Vag. Outlet	9	6
34	5	" " " Retrofl. Uteri	9.5	5
41	6	" " " " "	8	6
29	3	" " "	6.5	5
23	0	Retroflexio Uteri	8	..
37	10	Double Vagina. Bicomued Uterus Relaxed Vag. Outlet	8	..
50	5	Relaxed Vag. Outlet. Retrofl. Uteri	6.5	7
36	3	" " "	10	5
32	3	" " " Retrofl. Uteri	7	9
26	1	" " "	7	7
26	2	" " " Pelvic Inflam.	8	6
28	2	" " " Hemorrhoids	7	5
37	7	" " "	8	9
23	2	" " "	7	8.5
30	2	Prolapsus Uteri	8	..
34	4	Relaxed Vag. Outlet. Retrofl. Uteri	8	6
22	2	" " "	8	6
25	2	" " " Retrofl. Uteri	8	6
35	1	" " "	8	6
28	2	" " "	6	6
39	3	" " "	6	5
42	1	" " " Retrofl. Uteri	12	7
33	3	" " "	8	7
26	1	" " " Hemorrhoids	10	5
26	2	" " " Retroversio Uteri	6	6

No. of cases, 100.
Average diameter of meatus in 100 cases, 7.59 mm.
Average diameter of meatus in nulliparous women, 7.83 mm.

ABSTRACT:[1] THE FREQUENCY OF GALL-STONES IN THE UNITED STATES.

BY CLELIA DUEL MOSHER, A. M., M. D.
(SERVICE OF DR. KELLY.)

Gynaecological Externe in the Johns Hopkins Hospital Dispensary.

(*Read before the Johns Hopkins Hospital Medical Society, March 4, 1901.*)

Although numerous statistics on the frequency of gall-stones have been published abroad, yet, as far as I know, there have not been given results based on a large number of cases in this country.

To determine the frequency of gall-stones in America, at Dr. Kelly's suggestion and with the permission of Dr. Welch, I examined the records of 1655 complete autopsies (Table I) from the Pathological Department of the Johns Hopkins Hospital. Of the 1655 records examined 1037 were males and 618 females; 634 were black and 1018 white; the color in the remaining 3 cases was not given. In 115 cases, or 6.94 per cent. gall-stones were present. All the percentages are larger than for my first 1000 cases, which were quoted by Dr. Kelly.[2] The reason for this has not been found. Roth at Basel published two sets of statistics (Diagram I) in which a similar difference is observed.

TABLE I.

Frequency of Gall-Stones in Persons of Different Ages in 1655 Autopsies, from the Pathological Department of the Johns Hopkins Hospital.

Age of patients.	Number of autopsies.	Number of cases with gall-stones.	Percentage of cases examined in which gall-stones were present.
0–20	232	1	0.43
21–30	277	5	1.80
31–40	333	18	5.40
41–50	328	29	8.84
51–60	258	34	13.14
61 and over	219	28	12.17
Age unknown	8	..	....
Totals.....	1655	115	6.94

The percentage of frequency of gall-stones in Germany, Austria, Switzerland and the United States is shown in Diagram I. It will be seen that the frequency in this country most nearly corresponds to that given by Rother for Munich.

Naunyn, in his treatise on cholelithiasis, bases most of his statements on the statistics of Schröder (Table II) who analyzed the cases from the Strassburg Hospital, where the autopsies include all periods of life. Prof. von Recklinghausen vouched for the fact that in no case had gall-stones been overlooked. The statistics for this country have been compared with those given by Schröder because of the great accuracy of the latter and the fact that the more complete data allowed exact comparison.

DIAGRAM I.

The frequency of Gall-Stones in Germany, Austria and Switzerland as compared with the United States.

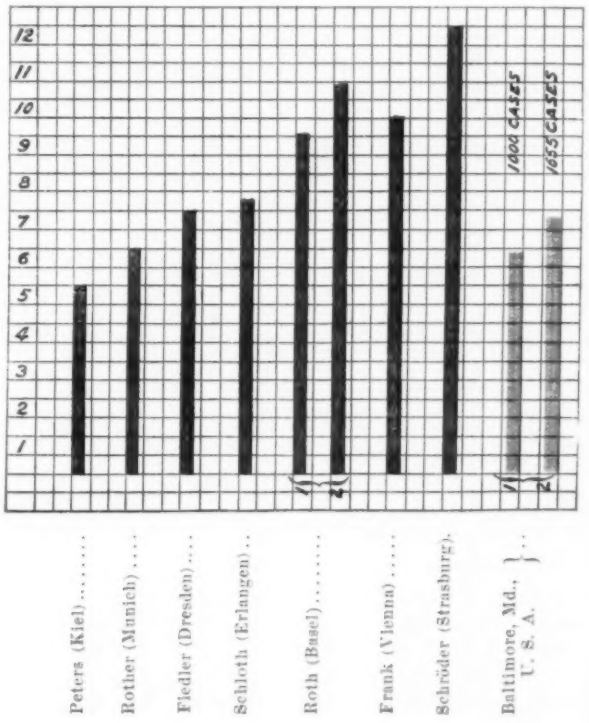


TABLE II.[3]

Frequency of Gall-Stones in Persons of Different Ages, according to Schröder.

Age of patients.	Number of post-mortems.	Number of cases with gall-stones.	Percentage of cases examined in which gall-stones were found.
0–20	82	2	2.4
21–30	188	6	3.2
31–40	209	24	11.5
41–50	252	28	11.1
51–60	161	16	9.9
60 and over	258	65	25.2
Totals.....	1150	141	....

Naunyn ascribes the variation in frequency of gall-stones in the statistics from different portions of Germany: (1) to the relatively larger or smaller number of young people included in any given number of cases; or, (2) to gall-stones being

[1] This paper in full will appear in Vol. X of the Reports of the Johns Hopkins Hospital.

[2] Kelly, Dr. H. A.: A Rapid and Simple Operation for Gall-Stones found by exploring the Abdomen in the course of a Lower Abdominal Operation, in Med. News, Dec. 22, 1900.

[3] Naunyn: A Treatise on Cholelithiasis; London, New Sydenham Society, 1896.

overlooked at autopsy. Although in the Johns Hopkins Hospital cases there is a somewhat larger proportion of young people included in the 1655 cases, a careful analysis shows that this fact fails to explain the much smaller frequency of gall-stones in this country. The second explanation is also inoperative here, as Dr. Welch has stated that gall-stones had not been overlooked in any case where they were present.

Age: Tables I and II show the distribution of the cases according to age groups.

Naunyn has called attention to the relative infrequency of gall-stones before the age of 30 years.

Diagram II shows the distribution according to age of both the German and American cases. The German cases are represented by the black line, the American cases by the red line. The irregularities in the German curve are probably apparent rather than real, the variation of the number of cases in each group probably being the reason. In Germany the greatest frequency appears to be after the 61st year, while in America the greatest frequency occurs between the 51st and 60th years. The American cases show a gradual

DIAGRAM II.

FREQUENCY OF GALL-STONES IN GERMANY AS COMPARED WITH THE UNITED STATES BY AGE GROUPS.

Germany (Schröder), 1150 cases.

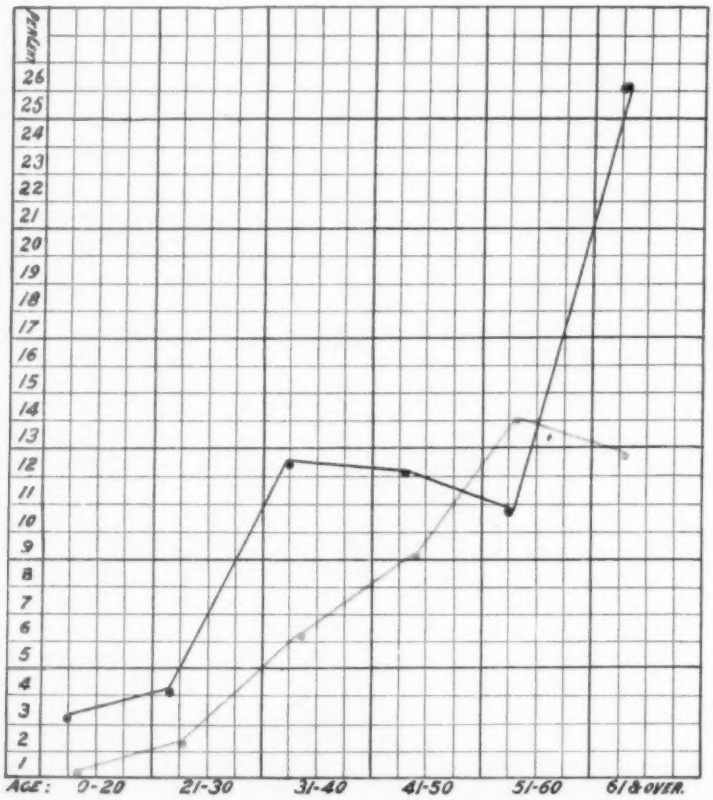
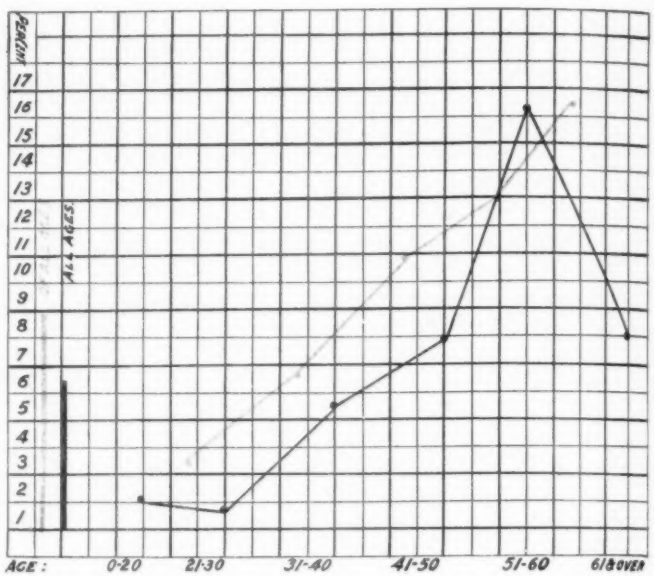


DIAGRAM III.

COMPARATIVE FREQUENCY OF GALL-STONES IN 1018 WHITES AND 634 BLACKS BY AGES (UNITED STATES).

Blacks



and almost uniform increase in the percentage frequency to the sixtieth year. The slight falling off after this age is apparent rather than real, being probably due to the smaller number of cases included in this group. These cases tend to confirm the usual statement that gall-stones are rare before the thirtieth year and more frequent after that period.

TABLE III.

Frequency of Gall-Stones in Whites of Different Ages in 1018 *Autopsies,*

[*From the Pathological Department of the Johns Hopkins Hospital*].

Age of patients.	Number of autopsies.	Number of cases having gall-stones.	Percentage of cases examined in which gall-stones were present.
0–20	133	..	....
21–30	152	4	2.63
31–40	206	12	5.82
41–50	211	21	9.95
51–60	164	20	12.25
61 and over	145	23	15.86
Age not given	7	..	....
Totals.....	1018	80	7.85

TABLE IV.

Frequency of Gall-Stones in Blacks of Different Ages in 634 *Autopsies,*

[*From the Pathological Department of the Johns Hopkins Hospital*].

Age of patients.	Number of autopsies.	Number of cases having gall-stones.	Percentage of cases examined in which gall-stones were present.
0–20	99	1	1.01
21–30	125	1	0.8
31–40	126	6	4.76
41–50	115	8	6.91
51–60	93	14	15.05
61 and over	70	5	7.14
Age unknown.....	6	..	....
Totals.....	634	35	5.51

Race: Table III gives the cases of 1018 whites arranged in age groups, with number of cases having gall-stones and the percentage frequency in each group; Table IV gives the cases of 634 blacks, similarly arranged with corresponding data. Gall-stones occurred in 80 whites, or in 7.85 per cent of the cases, and in 35 cases, or 5.51 per cent, of the negroes. Pending a study of a larger series of cases, we must conclude that gall-stones occur somewhat less frequently in the black than in the white race.

Sex: Naunyn states that according to Schröder's statistics 20.6 per cent, or about one in every five women, have gall-stones. A striking difference is apparent in this country, for gall-stones were present in only 58 cases (9.37 per cent) of the 618 female bodies examined. Therefore, in this country only one woman in every 10 or 11 would appear to have gall-stones—a frequency less than half as great among American as compared with German women.

DIAGRAM IV.

COMPARATIVE FREQUENCY OF GALL-STONES IN MALES AND FEMALES BY PER CENT OF ALL AGES COMBINED (United States).

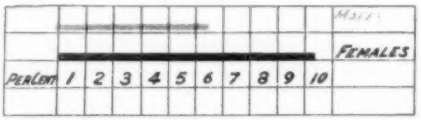


DIAGRAM V.

COMPARATIVE FREQUENCY OF GALL-STONES IN MALES AND FEMALES, BY PER CENT OF ALL AGES COMBINED (Germany).

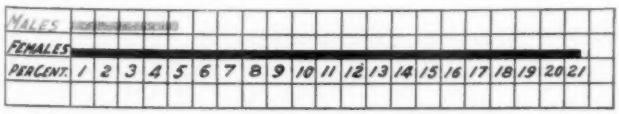


Diagram IV gives the comparative frequency of gall-stones in males and females in the United States, based on Johns Hopkins autopsies. The difference in frequency as compared with Germany is seen by comparing this with Diagram V, which is based on Schröder's cases, as quoted by Naunyn.

TABLE VI.

Frequency of Gall-Stones in Males of Different Ages in 1037 *Autopsies,*

[*From the Pathological Department of the Johns Hopkins Hospital*].

Age of patients.	Number of autopsies.	Number of cases having gall-stones.	Percentage of cases examined in which gall-stones were present.
0–20	107	..	....
21–30	180	3	1.11
31–40	202	7	3.46
41–50	213	13	6.10
51–60	170	14	8.23
61 and over	162	20	12.28
Age unknown	3	..	....
Totals.....	1037	57	5.49

TABLE VII.

Frequency of Gall-Stones in Females of Different Ages in 618 *Autopsies,*

[*From the Pathological Department of the Johns Hopkins Hospital.*]

Age of patients.	Number of autopsies.	Number of cases having gall-stones.	Percentage of cases examined in which gall-stones were present.
0–20	125	1	0.8
21–30	97	2	2.06
31–40	131	11	8.39
41–50	115	16	14.00
51–60	88	20	22.70
61 and over	57	8	14.21
Age unknown	5	..	....
Totals.....	618	58	9.37

Apparently the men in the United States have gall-stones in 5.49 per cent of cases as compared with 4.4 per cent for the German men, or about one per cent more frequently. Tables VI and VII give respectively the number of cases of males and females in the Johns Hopkins autopsies, arranged according to age groups, the number of cases occurring in each group, and the frequency of gall-stones for each age in percentage.

DIAGRAM VI.

COMPARATIVE FREQUENCY OF GALL-STONES IN 1037 MALES AND 618 FEMALES BY AGES (UNITED STATES).

Females ——
Males ——

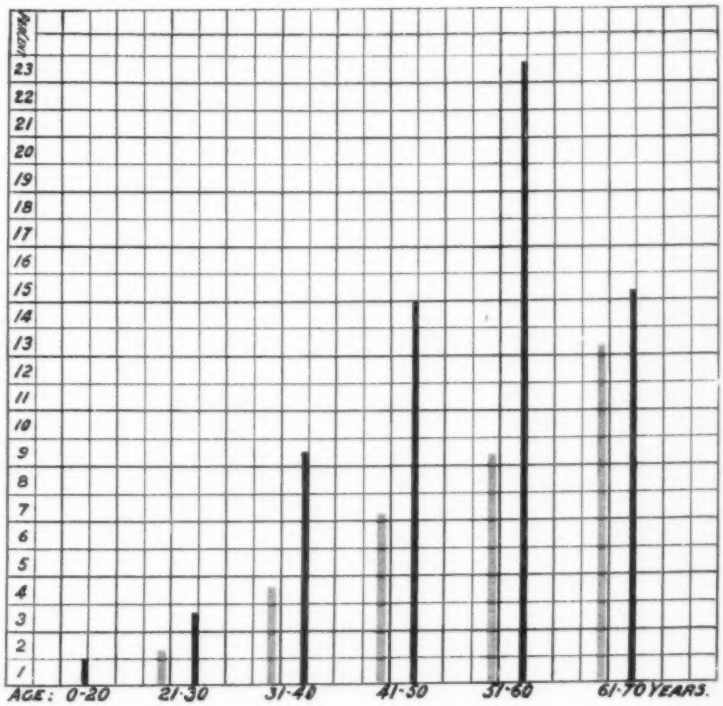


Diagram VI graphically shows these results. The black lines represent the frequency for the females in percentage in each age group, the red lines the frequency for the males. Again the females in the group of from 51 to 60 years old reach the maximum frequency of cases having gall-stones, and there is a falling off in the succeeding group of 61 years and over. If we refer to Table VII, it will be seen that the number of cases in the last group is rather smaller than in the preceding one, while a slighter difference in numbers is seen in the corresponding group of males. If we compare the character of the curve for the blacks in Diagram III, where the whole number of black cases was 634 as compared with the 1018 white cases, and remember that there are only 618 females as compared with the 1037 males, it will be seen that the two curves based on the two larger groups of cases correspond very closely in character, showing an almost uniform increase from age group to age group, both reaching their maximum in the last group. Of the two curves based on the smaller number of cases, 634 in one, and 618 in the other, both show the maximum frequency in the age group of 51 to 60 years. I am at a loss to explain this fact unless it be due to the smaller number of cases included in this last group.

Etiology: Naunyn has ascribed the greater frequency of gall-stones in women to wearing of tight clothing and to pregnancy, each of which hinders the flow of the bile. Schröder found gall-stones in more than half of the cases having a tight-lace furrow on the liver. Reidel showed that the deformity of the liver from this cause disturbed the normal situation of the liver, especially affecting the gall-bladder, which is turned downward, the cystic duct being stretched and the emptying of the gall-bladder made more difficult. Among the Johns Hopkins cases there was but one (Path. No. 988) in which this was noted. In this the gall-bladder had to be placed in a certain position before the fluid bile could be squeezed through the patent ducts, because there was a sharp deflection in the cystic duct. Wiesker demonstrated that the ligamentum hepato-duodenale is stretched in cases of floating liver or of floating right kidney; this also affects the cystic duct and hinders the emptying of the gall-bladder. Litten also pointed out that movable kidneys may cause biliary obstruction. Mignot, Gilbert, Fournier, Cushing and others have produced gall-stones experimentally in animals by the inoculation of attenuated cultures of the bacillus coli communis or bacillus typhosus. Dr. Cushing[4] calls attention to the necessity of producing the necessary catarrhal inflammation of the gall-bladder before calculi will form even when the organisms are present. Naunyn has also stated the two factors necessary to the formation of gall-stones to be stasis of the bile and the presence of organisms. Dr. Welch has also shown by the culture of streptococci as well as bacillus coli communis and bacillus typhosus that more forms than the two latter organisms may be concerned in the formation of gall-stones in the human subject.

Attention has been called to a number of the several favoring conditions which may produce stasis of bile in women. It may be worth while to enumerate them briefly once more.

1. Clothing: (a) changing diaphragmatic to the costal type of respiration and thus the absence of diaphragmatic action producing a stasis of the bile; for, according to the statements of Naunyn, Heidenhain and his pupils have proved experimentally that the descent of the diaphragm is an important factor in emptying the gall-bladder; (b) or causing gross lesions, such as the tight-lace furrow or long liver lappets, leading to displacements which cause mechanical obstruction to the outflow of the bile.

2. Lax abdominal walls, whether from inactivity or too frequently repeated pregnancies, and enteroptosis, by which the emptying of the gall-bladder may be hindered through the alteration of the relations of the gall-bladder and its ducts.

3. The presence of large abdominal or pelvic tumors, such as a large myomatous uterus or even in some cases the gravid uterus, thus producing pressure which may cause stagnation of the intestinal contents—a favorable condition for the invasion of the bile passages by the ever-present colon bacillus.

4. The great frequency of puerperal infections of varying intensity, as well as the numerous cases of pelvic inflammatory disease of other origin, with peritonitis and adhesions, may certainly furnish a number of cases of mechanical obstruction as well as sources of infection. In the male sex there is no corresponding group of possible sources of mechanical obstruction to outflow of the bile which can be compared with these favoring conditions in the female to the formation of gall-stones. It would seem probable that any one of these factors, acting singly, would be sufficient to explain the greater frequency of gall-stones in women.

Some authors have called attention to the frequency of gall-stones in the poor and badly nourished, while others have held that gall-stones occur more frequently in the rich and overfed classes. In order to determine this question, the cases from the Bay View Asylum and Almshouse service have been separated from the whole body of cases. By the courtesy of Dr. Opie of the Pathological Department, it was possible to get the records of 125 cases from the Bay

TABLE VIII.

Frequency of Gall-Stones in Persons of Different Ages, in 125 Autopsies.

[*From the Pathological Service of the Bay View Asylum and Almshouse.*]

Age of patients.	Number of autopsies.	Number of cases having gall-stones.	Percentage of cases examined in which gall-stones were present.
0–20	6	..	....
21–30	13	1	7.69
31–40	16	2	12.05
41–50	20	2	10.
51–60	20	3	15.
61 years and over .	50	8	16.
Totals.....	125	16	12.8

[4] Cushing, Harvey: Observations upon the Origin of Gall-Bladder Infections and upon the Experimental Formation of Gall-Stones, in Johns Hopkins Bulletin, Vol. IX, pp. 166-170.

View service. Table VIII gives these cases arranged in age groups, which makes it possible to contrast these cases with exactness.

Of the 125 cases from the Almshouse and Asylum 16, or 12.8 per cent, had gall-stones, as compared with the frequency of 6.94 per cent for all cases considered together. In other words, gall-stones were present in the Bay View cases almost twice as frequently as in the 1655 autopsies.

This increased frequency in the Bay View cases is partially but not wholly explained by the greater number of cases over 30 years of age in Almshouse and Asylum autopsies. The numbers are too small to warrant any conclusions at this time.

In 115 cases of the 1655 autopsies gall-stones were present. Death was to be attributed to their presence or effect in only 13 cases; in the remaining 102 cases the gall-stones were merely incidental.

The number of stones present, when specified, varied from 1 to 250 stones. The location of the calculi was as follows:

In gall-bladder alone	in 86 cases.
" and common duct	6 "
" and cystic duct	10 "
" and hepatic duct	1 "
In gall-bladder and common and cystic ducts	2 "
" " common and hepatic ducts	1 "
" " common, cystic and hepatic ducts	2 "
" " common, cystic, hepatic and the larger ducts of the liver	1 "
" " common, hepatic and larger ducts of the liver	1 "
" " larger ducts of the liver	1 "
In common duct alone	1 "
In cystic duct alone	1 "
Common and hepatic ducts	1 "
Location not specified. (Stones removed at previous operation.)	1 "
	115 cases.

From this classification it will be noted that gall-stones were present in the gall-bladder in 111 cases. In only 4 cases was the gall-bladder free from concretions when their presence was noted in any other portion of the biliary system. Biliary calculi were found in the ductus communis choledochus in 15 cases; in the cystic duct fifteen times; in the hepatic duct seven times, but always in association with calculi in other portions of the biliary system. Biliary calculi were found in the ducts of the liver in two cases. In the first case (Path. No. 1402) the concretions were only in the larger ducts of the liver; but in Path. No. 1530 the calculi were present in both the larger and smaller ducts. In 6 cases concretions were present at the papilla or the Diverticulum of Vater.

The condition of the biliary system was as follows:

Gall-bladder condition was noted in 28 cases. The gall-bladder was distended in 22 cases, not distended in 1, and reduced in 5 cases. There were adhesions about the gall-bladder in 14 cases; the peritoneum over the gall-bladder was thickened in 9 cases. The mucous membrane was thickened in 10 cases, eroded in 1, and necrotic in 2 cases. One case showed healed scars, and in 4 cases the mucous membrane was infected; in 4 cases the mucous membrane was stated to be normal.

Cirrhosis of the liver was present in 21 cases. There were liver adhesions in 24 cases. The capsule was thickened in 11 cases. Several small phleboliths were present in one case. The tight-lace furrow was noted in 4 cases, three times in women and once in a man.[5] A long liver lappet was present in 6 cases.

If we consider the gall-bladder adhesions and the adhesions about the liver, the number of cases in which mechanical obstruction to the flow of bile was possible is fairly frequent.

The condition of the bile was as follows: In 33 cases it was described as viscid, thick or tenacious, and in 1 case inspissated; in 10 it was cloudy or turbid; in 3 cases there was a granular sediment and in 1 case the bile contained solid particles. In one case the bile was so tenacious that it could not be squeezed through the patent ducts. In 11 cases it was described as fluid or thin. In 3 cases there was a mucous plug in the mouth of the common duct which had to be expressed before bile could be squeezed into the intestine. The above conditions might be grouped under a general head —cases in which was present mechanical obstruction, which might interfere with a flow of the bile. (1) Adhesions about gall-bladder or liver; (2) interference with the free movements of the diaphragm in respiration, indicated by the presence of tight-lace furrow on the liver; (3) changes in the bile itself when its fluidity is lost; (4) mucous plug in mouth of common duct.

Infections: Twenty-four cases were recorded in which was made a bacteriological examination of the bile. In 11 cases the bile was sterile. Bacillus coli communis was found in 7 cases; B. proteus vulgaris once; B. coli communis with the Diplococcus lanceolatus twice; the streptococcus was found in one case. Bacteriological examination of the gall-stones showed them negative in three cases. B. coli communis was present in one case, and a capsulated bacillus in another. Dr. Welch states that in addition to frequently having cultivated B. coli communis from gall-stones[6] he has also cultivated B. typhosus and the streptococcus.

In the cases where the bile and gall-stones are recorded as sterile, I understand it to mean that they were sterile as far as the ordinary pyogenic organisms are concerned, no special cultures being made to show the possible presence of the tubercle bacilli or the gonococcus.

In 12 cases there was recorded a previous history of typhoid fever. In 6 cases no bacteriological examination of

[5] Welch, William H.: The Bacteriology of Surgical Infections, in Dennis' *System of Surgery*, Vol. I, p. 265.

[6] Fitz, G. W.: A Study of Types Respiratory Movements, Journal of Exp. Med. Vol. I, p. 678.

stones or bile was made. In one case the bile and stones were sterile, and in one the stones were sterile. B. coli communis was present in the bile once; B. subtilis was found in the bile once; and the streptococcus was present once. In none of the 12 cases was B. typhosus recorded as being present.

The pathological conditions found were as follows:

Tuberculosis was noted in 14 cases, or 12.17 per cent.

Arterio-Sclerosis: Benecke has called attention to the great frequency of atheromatous degeneration with gall-stones. According to Naunyn the statistics of Sloth (Erlangen) and Schröder (Strasburg) have not strongly supported Benecke's statements. They found atheroma in about 25 per cent of their cases. Here there was arterio-sclerosis in 50 cases, or in 43.48 per cent of the 115 cases in which gall-stones were present.

Nephritis was the most frequent of all the associated conditions found. In 69 cases there was definite nephritis and in 9 additional cases there were lesions of the kidneys sufficient to interfere more or less with proper functioning, making a percentage of 72.17.

Uterine myomata were present in 13, or 22.43 per cent, of the 58 cases in which gall-stones were found in women. In 48 women whose gall-bladders Dr. Kelly explored in the course of a lower abdominal operation, gall-stones were found in 7 cases, or 14.5 per cent.[7] On examining the list it is found that every case, or 100 per cent, of these cases in which Dr. Kelly had found gall-stones had been operated upon for either myoma or large ovarian cyst. While the number of cases is too small to form any definite conclusions, this fact suggests a possible association due to pressure.

Carcinoma of gall-bladder occurred in 2 cases. Lumbroicoid worms were found in the gall-bladder in 2 cases. Pancreatitis was present in one case (Path. No. 1574). Pancreatitis with fat necrosis[8] was noted in four cases (Path. Nos. 214, 1530, 1567, 1614).

In 22 cases in which no definite concretions existed, there were abnormal conditions of the bile which suggested the possibility of a preliminary stage to the formation of gall-stones. The bile was described as follows: bile contains granular sediment; sandy particles; friable dark sediment, soft brown irregular flakes; flocculi, which on examination prove to be clumped typhoid bacilli; small masses of blackest pigment, etc.

Among our 115 cases, floating kidney was noted but once. In the Johns Hopkins cases, tight-lace furrow was recorded but four times, three times in women and once in a man as has been stated. Fitz has called attention to the effect on respiration of the wearing of tight belts by men. It is conceivable that since the type of respiration in women may be modified by tight lacing and a similar change produced in men by the wearing of tight belts, a deformity of the liver produced by tight lacing in women might also be produced by the wearing of a tight belt by a man. Among the 58 women having gall-stones, only 3, or 5.17 per cent, had the tight-lace furrow; if we include those cases having a long liver lappet as possibly due to constriction, it amounts to only about 19 per cent in which these lesions could possibly be considered an etiological factor.

Naunyn also states that, apart from these gross lesions, the bile stream is liable to be hindered by the dress of women and in pregnancy. He quotes Heidenhain and his pupils as having proved by experiment that the expulsion of the bile from the common duct is materially aided by the movements of the diaphragm.

My own experimental work on respiration has demonstrated that pregnancy interferes less with the respiration than has generally been believed. The respiratory movements in the different regions tend to become equalized, but the diaphragmatic respiration persists as late as the eighth and even the beginning of the ninth month of pregnancy. My experiments clearly demonstrate that clothing is the most potent factor in the production of costal type of respiration in many women.

It has been seen that myomata have been found in 22.43 per cent of the 58 women having gall-stones, and Dr. Kelly in operative cases has found gall-stones in 14.5 per cent of the cases where the gall-bladder was explored in the course of a lower abdominal operation; 100 per cent of his cases in which the gall-stones were present were operated on for myoma or large ovarian cyst. If the gravid uterus is an etiological factor in the formation of gall-stones, should we not rather look to the pressure effects as shown by any pelvic or abdominal tumor, as favoring such formation by producing constipation, than to the action on the diaphragm as the mode of action?

Conclusions: Pending the study of other series of cases from various parts of the United States, we may draw the following conclusions:

Nationality: On the basis on the analysis of the 1655 autopsies from the Johns Hopkins Pathological Department, as compared with 1150 (?) cases as given by Schröder of Strassburg, gall-stones are less frequent in the United States than in Germany, the United States showing a frequency of 6.94 per cent, Germany of 12 per cent.

Age: The frequency of gall-stones in a given number of cases will increase with the age of the patients examined. The American cases tend to confirm the statements of previous observers that gall-stones are rare before the thirtieth year and more frequent after that age.

Color: Gall-stones are more frequent in the white than in the black race, the American cases showing a frequency of 7.85 per cent in the whites and 5.51 per cent in the negro.

Sex: Women are more liable to have gall-stones than are men, the American cases showing the frequency in 618 women to be 9.37 per cent, and in 1037 men to be 5.94 per cent. The American women have gall-stones only about half as frequently as the German women. In the United

[7] By an error the percentage frequency of gall-stones was printed in Dr. Kelly's article as 8 per cent when it should have read 8 cases.

[8] Opie, Eugene L.: The relation of Cholelithiasis to Disease of the Pancreas and to Fat Necrosis, in Amer. Jour. of Med. Sci., Jan. 1901.

States only about one woman in every 10 has biliary calculi, while in Germany, according to Naunyn, gall-stones are found in 20.6 per cent, or in about one woman in every 5.

DISCUSSION.

Dr. Kelly: I am sure all have listened with much satisfaction to this well prepared and interesting paper by Dr. Mosher. It is particularly satisfactory to me that we send out from this Society the first elaborate statistics compiled on this subject in America. The immediate occasion of Dr. Mosher's investigation was that I have recently, whenever making a large enough abdominal incision, made an exploration of all the abdominal organs, and in these cases I have found about 14.5 per cent of gall-stones with more or less extensive pathological changes. In each instance I removed the stones by a simple and rapid operation by pushing the stone up against the abdominal wall from within, while cutting down from the outside on the hard body; I then everted the gall-bladder, incised it, and the stones were popped out. It then became a matter of interest to know just how frequently gall-stones were found, and Dr. Mosher has taken up the work and has made a wide and thorough investigation.

TENDON TRANSPLANTATION.[1]

BY SYDNEY M. CONE, M. D.

Fertile fields in physiology have been opened up before now through work done in the pathological laboratory. How much did the degeneration of nerve tracts aid in working out the anatomy of the cord?

There is no present knowledge of the limit to which the questions brought up and answered in the recent work on tendon transplantation will lead. Some very interesting physiological as well as surgical facts are before us.

Nicoladoni, in 1881, successfully changed the position of some active tendons in a paralytic club-foot to take the place of the paralyzed muscles. In the three cases reported he improved the mechanism of the feet very greatly. It seems that the operation should at once have taken a firm position in surgery.

It was not until Goldthwait published his cases in 1896 that the subject was again brought before us. Since then in Germany, France and the United States a number of orthopedic surgeons have demonstrated the great value of tendon transference. Its position in surgery is assured, not only because of the great usefulness of the procedure, but also because of the absolute safety and exact surgery of the operation. It is used in various conditions. Goldthwait, Bradford, Vulpius and Hoffa have described fully the method of application for deformed feet following infantile paralysis. Eulenberg, Hoffa and Vulpius wrote of its application to the cure of the spastic condition in Little's disease. Rochet, Townsend, Franke, Drobnik, Vulpius and others described the use of tendon anastomosis in musculo-spiral paralysis. Goldthwait, Vulpius and Milliken carried the active sartorius over into the fascia of the quadriceps femoris. Hoffa united the deltoid to the paralyzed triceps.

Vulpius and Hoffa both claim the usefulness of this operation in cases of muscular dystrophy. Eulenberg and Hoffa suggest the advisability of using implantation in case of apoplexy paralyses. It has been used successfully after traumatic paralysis or where muscles were congenitally absent.

[1] Read before the one hundred and third Annual Meeting of the Maryland Medical and Chirurgical Faculty, April 25, 1901.

Kunik, in naming the operations according to how the tendons are united gives four forms. He adds to the "active," "passive" and "active-passive" forms of Hoffa a method used by Goldthwait—transplanting the periosteal insertion of the tendon to another place on the bone. Goldthwait used this in relaxation of the patellar ligament with dislocation of the bone. As a rule, Lange, of Munich, uses the periosteal method. He adds to the technique an original and interesting method of lengthening the tendons which he desires to transplant. If in carrying the biceps and semitendinosis around the femur to take the place of the quadriceps, he finds these united tendons too short, he supplies the deficiency with silk, which he sews to the periosteum at the tubercle of the tibia. Not only do these two posterior muscles take the place of the anterior paralyzed one, but the tissue thickens about the silk and makes a permanent attachment. The other three methods are named differently by various operators.

Hoffa refers to the union of a divided sound tendon into a paralyzed one as "active": Vulpius calls this a "descending" transplantation, while Kunik uses the expression "intraparalytic implantation." When the divided distal end of a paralyzed tendon is carried to the sound, undivided tendon, Hoffa uses the term "passive," Vulpius names this "ascending" transplantation, while Kunik calls it "intrafunctional implantation." Where both are divided and united both names are combined, a hyphen separating them, *e. g.* "active-passive."

Having determined that the operation is necessary, the method to pursue is, as a rule, determined simply by the anatomy of the part involved. Hoffa gives a schedule of various paralyses, their accompanying deformities, and suggests the method of transplantation suitable for the case in hand.

It is conceivable in some instances that owing to changed anatomical conditions, other methods of effectual tendon transference might be adopted. Goldthwait demonstrates this in the pictures he shows of the unusual action of the

peronei muscles when, after long paralysis of the posterior group of leg muscles, they are carried forward in front of the malleolus. Again, in case of the sartorius, the action differs according to the amount of padding forming the fulcrum for it to act upon. It is not difficult to abstract the best from what has been written on this subject up to the present time.

Before deciding to operate, the patient must have had every possible chance for the relief of the deformity. Massage, electricity, active and passive movements are usually recommended for one or two years before advising operative measures. If immobility prevents the limb being placed in a good position, "redressement" must precede the operation.

A thorough electrical and physical examination must be made. One cannot always depend upon the intelligence of the patient in determining what muscles are intact. It may even be necessary to await the first incision before we learn the condition of the muscles. The normal muscle is dark red, the paretic muscle is rose red, while the completely paralyzed muscle is yellow. While the method of uniting the tendons differs, it is generally conceded that the least possible traumatism to sheath and tendon is required. The broadest union one can get and a freshly serrated surface are desirable. Silk is generally conceded to be the best suture material. Quilted sutures are preferred as a rule.

The first dressing is done in nine days, but the limb must remain in plaster for about five weeks, after which massage and passive action may be adopted.

It is usually noted that the new arrangement works well at the first dressing.

There are few variations in the method of treating the same paralytic condition. In musculo-spiral paralyses, Rochet, Franke, Vulpius, Drobnik and Townsend have had the greatest experience. They agree that it is usually necessary to shorten one or more of the extensor tendons, transplanting a flexor muscle at the same time. The flexor muscle most commonly recommended to be used is the flexor carpi ulnaris. Townsend advises carrying it between the radius and ulna, while other operators prefer to wind it around the wrist. The operations upon the foot present few alternatives as seen from Hoffa's schema.

When the newly transplanted muscle takes on its new work shortly after the tenth day one is led to question how this is to be explained. How is it that a flexor extends? How explain that a muscle accustomed to act through being stimulated by a nerve lookekd upon as governing one kind of motion, now changes its way of acting under the same nerve influence? It would seem that the changed condition of things in the periphery causes a changed central (brain) arrangement. The nerves have no specific action, they are merely the connecting links between muscle and brain.

Lange made a most interesting observation in cases IV and V of his series, where he split the tibialis anticus tendon and attached one portion to the cuboid bone. This muscle learned to perform two separate movements—inward and outward rotation of the foot. If one and the same muscle can be thus doubly educated, it should not seem strange that when relieved of all its original duties it could accommodate itself to a new simple brain-muscle relationship.

It is due to a rapid re-education of the transplanted muscle, which is more apt to take place in youth "before the frequently practiced coordinated actions, especially those associated with position, have become fixedly automatic" (Eulenberg).

Drobnik says that the nerve centres accommodate themselves properly within certain bounds to the changed grouping of the muscles.

Eulenberg says "It is not only possible, but in the highest degree probable, that excitations are set up in a centripetal manner in the cortical portion of the brain which regulates coordination. These can connect themselves with regulating impulses starting in the cortex, which impulses were meant for other work and purposes. These central apparatuses, commanding and regulating the coordinating mechanism, must possess a much greater adaptability in young children than in adults, in whom the more important and oft-exercised coordinated actions, especially those associated with place, have become fixed in firmly arranged automatic actions. The artificial peripheral switching off of the centrifugal innervation into other antagonistic muscles for purposes of divided function or transferred function must cause changes in the centripetal impressions and reactions. Probably this change will shut off tracks already present and form new routes. Thus we would get a new regulation of the whole innervation founded on the new functional needs."

This will explain any of the problems in this much-discussed field. It even touches the question one must ask when, in a case like the one I shall describe, following correction of the deformity of the foot the paralyzed thigh muscles recovered their activity. It would seem that having a group of muscles which have been educated together, several of them being lost, the rest do not get the centrifugal stimuli they formerly got because the centripetal stimuli were wanting. Now, when the old centres in the brain are again stirred up by centripetal stimuli, after the operation on a few of the paralyzed muscles which were accustomed to start the motion in the coordinated movement, all get the centrifugal stimulus thus set up.

The case to be reported is that of a girl (K. S.), 7 years old, admitted to the Robert Garrett Hospital, Jan. 9, 1901.

She had been lame for four years, dragging the left limb in an everted position. The foot was in the position cavus and had little support at the ankle joint. It was slightly pronated. Very little information could be obtained from the mother about the origin of the paralysis. It came on suddenly while the child was in good health. The child began to limp, the leg wasted, and the skin took on the appearance of "goose skin."

Examination showed the left limb to be from 2-5 cm. smaller than the right one. Electrical and physical examination showed paralysis of the tibialis anticus, gatrocnemius, soleus, tibialis posticus and flexor longus pollicis. She could

not invert the limb at all, whether from paralysis of the semimembranosis and tendinosis gluteus medius or tensor vagina femoris, or to all, I could not determine. No electrical response was noted in any of these muscles.

On Jan. 22, under ether, an incision was made 8 cm. long across the tendo Achilles. The peroneus longus and brevis were exposed and cut across near their insertions. The peroneus brevis was carried under the tendo Achilles and through an opening in the flexor longus pollicis. The peroneus longus was serrated and passed through a slit in the width of the tendo Achilles. Quilted sutures were used to fix them as described by Goldthwait. A silver wire subcutaneous suture closed the wound. In ten days (Feb. 1) the first dressing was made, showing union *per primam*. The child was kept in plaster for three weeks, then given massage and passive movements. She soon began to walk without a plaster dressing. It was noted at once that she turned the foot in, although there remained a tendency to outward rotation when she did not try to hold her limb in the correct position. To correct the supination and laxity of the support on the inside of the foot, I did the second operation on April 5. The opportunity to do these operations was afforded me through the kindness of Dr. Platt.

An incision 6 cm. long was made above the annular ligament, exposing the tibialis anticus and extensor longus digitorum. A section of the tibialis was carried through an opening made in the extensor longus digitorum and held there with quilted sutures.

The skin suture was silver wire. The first dressing was done in eight days. The wound had healed *per primam*, and the contraction of the extensor longus digitorum drew the foot in and up. The patient left the hospital in four weeks with the foot in plaster. The child is now at home, being treated with massage, passive and active exercise. She has perfect plantar flexion and improved use of her dorsal foot muscles, and will doubtless continue to increase the activity of her newly acquired movements.

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PROCEEDINGS OF SOCIETIES.

THE JOHNS HOPKINS HOSPITAL MEDICAL SOCIETY.

February 18, 1901.

In the absence of the president, the meeting was called to order by Dr. Osler.

Chorea with Embolism of Central Retinal Artery. Dr. Thomas. **Ophthalmoscopic Appearances.** Dr. Reik.

(To appear in a future number.)

Volvulus of Meckel's Diverticulum with Recovery after Operation. Dr. William J. Taylor, of Philadelphia.

(To appear in October Bulletin.)

Monday, March 4, 1901.

In the absence of the president, the meeting was called to order by Dr. Kelly.

Exhibition of Medical Cases. Dr. McCrae.

The cases I will show this evening are cases of severe anæmia that might well be called pernicious anæmia. They

are now to be shown, however, on account of some associated symptoms.

The younger is aged 38 and came in complaining of stiffness in the arms and legs with some numbness. His present illness dates back to the summer of 1898, when he was somewhat "run down." He continued to work until March, 1900, when he was compelled to stop on account of shortness of breath and weakness. In the January previous he had a carbuncle of the neck which presented nine openings. He has a curious waxy, yellow color, is very weak and has sometimes shortness of breath.

I would like first to call attention to a symptom that may have some bearing on the cause of pernicious anæmia. You are probably all familiar with the recent writings of Dr. William Hunter, who has suggested that pernicious anæmia is often due to foci of suppuration, sometimes even so simple as a carious tooth. On examination we found this patient's teeth exceedingly bad, and he tells me that has been his condition for five years past.

His blood shows no special features beyond a hæmoglobin estimate of 50%, a red count of 2,500,000, and leucocytes 2000, with 45% of mononuclears and an occasional nucleated red cell. Coming to the sensory symptoms of which he complains, namely, numbness and tingling, we have not made out anything peculiar on examination about sensation which appears to be normal. His knee-jerks are exaggerated.

The other case, a patient of 58, has been in the hospital since the 8th of October. He complained of numbness of the limbs and pain along the spine, his symptoms dating back for a period of 18 months. His first symptom was weakness. He fell down stairs one day and after that was unable to work for some time. His blood on admission showed 1,900,000 red cells, a hæmoglobin of 48%, and 48% of mononuclears. On admission he showed a curious tottering gait and was almost unable to walk unsupported. He had no Romberg sign and the knee-jerks were somewhat exaggerated. He has improved very much, but still walks with some hesitation and holds himself stiffly. The knee-jerk has gradually diminished until now it is only elicited with some difficulty. His hæmoglobin went up to 70% and the red corpuscles to 3,500,000 per cmm.

The whole group of spinal symptoms in connection with anæmia is extremely interesting, although as yet the subject is in a rather chaotic state. One can separate undoubtedly a group of cases of which this man is a type that are associated without doubt with pernicious anæmia. A number of cases have been reported from the National Hospital for Nervous Diseases in London that occurred after anæmias that are evidently secondary anæmias.

In anæmias, three types have been described: one where the anæmia is primary, a second where the cord changes are primary and anæmia develops later, and a third where with anæmia there are no symptoms of spinal cord involvement during life, but it is found on section. The coincidence of these two cases is interesting.

In regard to the question of treatment, I think this young man should undoubtedly have his mouth carefully attended to, the carious teeth drawn and the mouth cavity cleaned up as well as possible. In addition to that, he is getting arsenic and good feeding. The outlook is difficult to determine. In the other case, judging from the cases reported, the progress is probably downwards. Three stages of that have been described: First, a spastic condition; second, the condition in which he is now; and thirdly, a perfectly flaccid paralysis that usually ends fatally. He has been having the ordinary treatment of good food, arsenic and fresh air. In the last two or three weeks he has lost nearly a million red blood-corpuscles, but there is no increase in the spinal-cord symptoms in connection with that drop.

Discussion.

Dr. Thayer.—Within the last two years I have seen two very interesting cases of pernicious anæmia with symptoms of involvement of the cord. In the first instance, seen last year with Dr. Watson, the patient developed a very high degree of ataxia of both lower and upper extremities and loss of reflexes. There was incontinence of urine and faeces.

The second case I saw about two weeks ago with Dr. Beck. The first symptoms of her anæmia began during the heated term last summer. During the fall she began to have difficulty in using her fingers and her hands became weak. There was considerable numbness and tingling. She was unable to button her clothes. Shortly afterwards she began to have the same sensations in her feet and noticed a certain unsteadiness of gait. On several occasions she fell. When seen the patient showed a high degree of anæmia, only about 1,500,000 red corpuscles; there was no marked atrophy in the upper extremities, but great weakness of the muscles in the arms and hands. A distinct increase of the reflexes at the elbows and wrists. There was fairly well-marked ataxia, especially of the right hand, the patient being unable to unbutton her clothes. There was no atrophy in the legs or thighs, no fibrillary tremor; knee-jerks diminished but still present. On superficial examination sensation to touch and pain was normal throughout. The patient distinguished the head and point of a pin well in both arms and legs.

With regard to the question of treatment of pernicious anæmia, it is interesting to note that Dr. Cabot, who has seen a large number of cases, is of the impression that arsenic is of little or no value. He states that rest, fresh air and judicious feeding are the most important points in treatment. I must say that this statement has seemed to me rather surprising. The observation of the cases which have occurred during the last eleven years in Dr. Osler's clinic has led us to believe that the drug is of value in many instances.

Dr. Futcher.—I would like to say simply a word or two in regard to the suggestion of Hunter that pernicious anæmia may be due to the condition of the teeth. When one reads his article one is not very thoroughly convinced that his cases were really due to the involvement of the teeth. His view is that as a result of the caries of the teeth, toxic substances are formed by the bacteria present, which on being

absorbed into the blood cause a destruction of the red blood-corpuscles. He holds that the gastritis so frequently present is very often secondary to the suppurating teeth. He reported nine cases in his original paper, and in all probability there is some connection between the two conditions, but his observations require further support before being accepted. I think in this case, as Dr. McCrea suggests, it would be important to have the teeth attended to.

Contribution to the Study of the Frequency of Gall Stones in the United States. Dr. Mosher.

(See page 253.)

Diabetes Mellitus Associated with Hyaline Degeneration of the Islands of Langerhans of the Pancreas. Dr. Opie.

The pancreas, it is well known, closely resembles the salivary glands. The larger ducts are lined with high columnar epithelium which becomes lower and cubical in the smaller branches while the terminal ducts are formed by flat epithelial cells. The secreting acini are composed of high, characteristically glandular cells. Scattered throughout the organ and distinguishing it from other glands are the peculiar bodies first described by Langerhans in 1869. These consist of small polygonal, non-granular cells, which differ markedly from the ordinary secreting cells and are not arranged about a central lumen. When the blood-vessels of the pancreas are injected, corresponding to these groups of cells are seen glomeruli of dilated and tortuous anastomosing capillaries. The cells of the island form small solid columns which lie in the meshes of this capillary network. These bodies are not penetrated by the ducts and they are entirely independent of the secreting apparatus. In architecture they resemble certain ductless glands, the coccygeal and the carotid glands, the parathyroid bodies and less closely the pituitary gland, the adrenals and the thyroid. Their structure suggests that they exert some influence on the blood and are independent of the external secretion of the acini.

Experimental work has conclusively demonstrated that the pancreas bears an intimate relation to carbohydrate metabolism. When the organ is extirpated, sugar accumulates in the blood and is excreted by the kidneys. The association of lesions of the pancreas with diabetes has long been known, and in view of the experimental results a variety of destructive lesions of the gland may be regarded as the cause of the disease. Chronic interstitial pancreatitis is the most common of such lesions. Diabetes, however, does not always accompany chronic pancreatitis.

In a recent number of the Journal of Experimental Medicine I have described two types of chronic pancreatitis. With one variety, which may be designated interlobular, the increase of interstitial tissue is between the lobules and invades them from the periphery. In the second variety the interacinar, the new growth of tissue is more diffuse and penetrates between the acini. In the first the islands of Langerhans are affected by the lesion only when it has reached a very advanced grade. To this type belongs the chronic inflammation which follows occlusion of the pancreatic duct. If the duct be obstructed by calculi or carcinoma the secreting acini are destroyed and replaced by fibrous tissue, but the islands of Langerhans remain unaffected until the sclerotic process is far advanced.

Of eleven cases of interlobular pancreatitis, in only one was diabetes present, and here the chronic inflammation which followed occlusion of the duct was so far advanced that the organ was almost entirely replaced by dense scar-like tissue in which the persisting islands of Langerhans had undergone alterations. Diabetes had been of very mild severity, and sugar had disappeared from the urine when the patient was put upon a diet poor in carbohydrates. Of three cases of interacinar pancreatitis, in two diabetes was present, while in the third the lesion of the gland was very slight and the organ was of large size, weighing 170 grammes. Where diabetes accompanied chronic interstitial pancreatitis, the islands of Langerhans were implicated in the inflammatory change; diabetes did not accompany those lesions which spared the islands.

In the same report I described a case of diabetes in which the pancreas was the seat of a very remarkable change. Throughout the gland were sharply circumscribed areas in which between the capillary wall and the parenchymatous cells hyaline material had been found. These areas in many instances corresponded in shape and size to islands of Langerhans, and nowhere in the gland were these bodies still recognizable. Not infrequently, however, the areas of hyaline degeneration were much larger and evidently represented in part at least secreting parenchyma.

In a case of diabetes which has recently come to autopsy, the pancreas was the seat of a similar hyaline change limited to the islands of Langerhans. This condition occurred in a negress, 55 years of age, who for eleven months before admission to the Hospital had suffered with severe cough. Several months after the onset of her illness she noticed that her urine had become pale and was very abundant, so that at night she was compelled to void it every hour. There were great hunger and thirst. These symptoms lasted during a part of the spring and summer, but disappeared several months before her entrance into the hospital. On admission, physical examination showed the signs of partial consolidation of both lungs and of cavities in both apices. In the sputum were numerous tubercle bacilli. The urine contained a large quantity of sugar (4 to 5.4%), although for several months she had had no symptoms indicative of diabetes. She died on the seventh day after admission; death was not preceded by coma.

At autopsy the lungs were found to be studded with tubercles, the upper lobes were consolidated, and at both apices were large cavities. Small tuberculous ulcers were present in the intestine. There were no other noteworthy lesions in the body. The pancreas was of normal size, weighing 80 grammes, and was of the usual color and consistency. Microscopic examination, however, demonstrated a lesion even more remarkable than that of the previously mentioned case.

In varying amount within almost every island of Langerhans was a homogeneous hyaline material replacing the epithelial cells. It stained deeply by acid dyes, eosin and picric acid, and in sections treated by Mallory's method for the demonstration of fibrous tissue and reticulum assumed a very conspicuous deep blue color; the reactions of amyloid were not obtained. The smallest particles of this substance were polygonal in shape and corresponded in size to the cells of the island. Transitions between the granular nucleated cells and these homogeneous hyaline particles were found. Where the process was more advanced the cells of the island were in great part or wholly transformed, and there occurred small, round or oval masses of hyaline material penetrated by the remains of capillaries whose endothelial cells finally disappear. The secreting parenchyma was unaffected by the lesion described.

In none of the cases which I had previously described was a lesion of the pancreas limited to one or other element of the gland. Where diabetes accompanied a lesion of the islands of Langerhans the secreting parenchyma was also implicated. Where diabetes was absent, the islands persisting unaltered though the secreting parenchyma was in large part destroyed, a considerable proportion of the glandular substance still remained intact. In the present case, however, diabetes followed a lesion affecting only the islands of Langerhans. It furnishes, I believe, conclusive demonstration of the inferences drawn from the preceding series of cases. Diabetes mellitus when the result of a lesion of the pancreas is caused by destruction of the islands of Langerhans and occurs only when these bodies are in part or wholly destroyed.

Discussion.

Dr. Futcher.—I would like to emphasize the great importance of this observation of Dr. Opie's. It is one of the most important on the pathology of diabetes mellitus that has been made in several years. For a good while the pancreas was supposed to be closely connected in some way with the proper metabolism of carbo-hydrates in the system. In experimental work it was shown that ligature of the pancreatic duct preventing the outflow of the pancreatic secretion into the intestine did not lead to diabetes. It was inferred that there was some internal secretion produced by the pancreas which reached the general circulation without entering the intestinal tract. A number of years ago Lépine advanced the theory that this internal secretion probably contained a ferment to which he gave the name glycolitic ferment. He believes that it has the function of causing the proper combustion of the carbo-hydrates and preventing their appearance in the urine. It is possible that these islands of Langerhans are connected in some way with the production of this ferment, if such a ferment exist. It is at least a very suggestive idea, and it seems quite conclusive from Dr. Opie's researches that the inferences drawn from his earlier work in this line were quite correct.

Carcinoma of the Male Breast. Mr Warfield.

(To appear in a future number.)

March 18, 1901.

The meeting was called to order by the president, Dr. Welch.

A Curious Form of Peritoneal Tuberculosis. Dr. MacCallum.

(To appear in a future number.)

A Lipo-Myoma of the Uterus, with Exhibition of Specimen. Dr. Knox.

(To appear in a future number.)

The Advances Made in Medical and Surgical Diagnosis by the Roentgen Method. Dr. Charles Lester Leonard, of Philadelphia.

(To appear in a future number.)

Monday, April 1, 1901.

The meeting was called to order by the president, Dr. Welch.

Exhibition of Medical Cases. On Hemorrhage in Chronic Jaundice. Dr. Osler.

An interesting fact in connection with diseases of the liver, associated with jaundice, is the tendency to hemorrhage. In cirrhosis of the liver, even with very slight jaundice, there may be frequent bleedings, especially to epistaxis, of which we have a case in ward now. In chronic jaundice there is a marked retardation of the blood coagulation time, sometimes even to 15 or 20 minutes, and with it there is a liability to spontaneous hemorrhages and a tendency to bleed from wounds, more particularly those of operation. Surgeons have this very painfully impressed upon them in recurring, obstinate, and even lethal hemorrhage following gall-stone operations. We have had lately four cases in the ward with jaundice and severe hemorrhages.

Case 1. Carcinoma of liver and gall-bladder. Mrs. K. had suffered with jaundice, accompanied by a great deal of pain for four months. The blood coagulation time on admission was ten minutes. A deep-seated tumor-mass of doubtful character was felt in the region of the liver. The extreme persistence of the jaundice and severity of the pain made us suspect malignant disease. On January 27 she had some slight bleeding from the gums and there was a small quantity of blood in the stools. On the 28th she bled a great deal more and was in such a desperate condition that it was thought advisable to perform a laparotomy. This was done on the following day and a carcinoma of the gall-bladder was removed. That night a severe hemorrhage occurred and persisted till death.

Case 2. You may remember that a few weeks ago I showed a remarkable case of multiple xanthelasmata and that

I referred to a second case in the house at the time but too ill to be brought down. She is now before you and illustrates in a remarkable way the feature of which I am speaking. The jaundice has existed for ten years, arising originally, in all probability, from gall-stones. The point of special interest is that she has had four attacks of hemorrhage of a very severe character, the last occurring February 18, the day before admission. For four days she had been bleeding from the nose and uterus, and at time of entrance was almost bloodless; coagulation time 14 minutes. She has steadily improved while here, the red cells having reached normal and the coagulation time has fallen to four minutes. She has gained weight at the rate of 2 pounds a week, and says she has not been so robust for some years past. The jaundice has lessened.

Case 3. Mrs. F. came in recently with a jaundice of 14 months' duration and evidences of gall-stones in the common duct. She had never had hemorrhages. Blood coagulation time was 8 minutes, but it fell gradually to 3½ minutes and she was transferred to the surgeons and operated upon March 5. Numerous gall-stones were found in the common duct and in the gall-bladder. The day after operation there was a small hematoma in the region of the incision, and four days later she nearly bled to death. She recovered from the collapse, however, and has since done well.

Case 4. This patient was admitted in February with jaundice, nausea and a great deal of pain; coagulation time 3½ minutes. She was transferred to the surgical side on March 8. On the day following, she had a very severe pain in the abdomen, which was followed the next day by a sudden collapse and death in a few hours. Subsequent examination showed a most extensive hemorrhage into the lesser peritoneum, the stomach and the tail of the pancreas. She had gall-stones and cancer of the gall-bladder and liver.

These cases illustrate the liability to hemorrhage in chronic jaundice and the risk in connection with operation. They show also the possibility of reducing the blood coagulation time to normal by treatment. Professor Wright, of Nettey, has shown that the coagulability of the blood could be increased by calcium chloride. Subcutaneous injections of gelatin have the same effect, and we use these measures in cases of jaundice before transferring them to the surgical side.

Typhoid Spine. Dr. Osler.

This patient illustrates a very remarkable and unusual condition, which sometimes puzzles the physician. It is among the rarer sequelæ of typhoid fever. The condition was described by Gibney, of New York, as typhoid spine, and you will find in our Studies on Typhoid Fever an interesting series of cases. The condition follows usually a protracted attack, as in this case, which was admitted Nov. 6 and discharged Jan. 12, after a long and severe illness. He was a little nervous before leaving the hospital, but made a good recovery, which is the usual history. A month or six weeks subsequent to convalescence the patient begins to complain of pain in the back, with stiffness, and finally develops a complete picture, as you see it here.

The patient is a robust, healthy looking fellow, of fairly good color, but you can see that he is nervous and apprehensive. He was brought into the hospital supported by two friends, and it was with the greatest difficulty that he could be induced to sit down or lie down. Any movement of the back was excessively painful, and he winced on pressure. After he was put to bed, and had the thermo-cautery and the wet packs, he improved with great rapidity, and was soon able to be up and about. He is still very nervous, and he has still slight stiffness and tenderness of the spine. These cases all present a singularly uniform picture; first, a condition of neurasthenia, often of a very marked degree; some cases become very hysterical. Secondly, stiffness of the back, so that attempts to turn or to stoop are very painful. I have known a patient to remain in bed for six weeks or more, unable to sit up or move about without agonizing pain. Thirdly, pain on pressure is usually elicited in the lower part of the back, sometimes, as in this patient, more to one side than the other, and at times directly over the sacro-iliac synchondroses. Fourthly, and this is an all-important point, the local examination is negative, there is no sign of swelling, no fever as a rule and no leucocytosis. And lastly, the patients get promptly well, or improve with great rapidity, with the use of the Paquelin and measures directed to their neurasthenic condition. It is true it sometimes takes weeks or months before a complete cure is effected.

The condition has been termed a post-typhoid spondylitis, and it is possible that in some cases there may be actual inflammation, but whatever the nature of the malady, and I must confess it is extremely obscure, I do not think there is a bone lesion similar to that which occurs so frequently after typhoid fever, and which almost invariably proceeds to suppuration. I have not met with an instance, nor do I know of one in the literature, in which suppuration has followed in any part of the spine. I have always regarded the condition rather as a neurosis, and I must say that it responds to the treatment which we employ in this class of cases.

Intestinal Dystrypsia (Classification and Pathogenesis). Dr. J. C. Hemmeter.

Foetal Transmission of Typhoid Fever. Dr. Lynch.

Abscess in the Abdominal Wall. Report of Cases. Dr. Hunner.

NOTES ON NEW BOOKS.

Uterine Fibromyomata, their Pathology, Diagnosis and Treatment. With 49 illustrations. By E. Stanmore Bishop, F. R. C. S., Eng. (*Philadelphia: P. Blakiston's Son & Co.*)

Although the subject of uterine myomata has always been one to which the gynecologist and general surgeon have given much attention, the literature bearing on them being very extensive, this work of Bishop's is the first extensive book to ap-

pear in English, devoted entirely to the consideration of these tumors. It comprises some 300 pages, dealing with their histogenesis, symptomatology, diagnosis and treatment, and while by no means exhaustive, especially from a pathological standpoint, the author has succeeded well in "giving a comprehensive view of the subject," his object, as stated in the preface.

Bayle has estimated that myomata occur in 20 per cent of all women over 25 years of age, while Kolb states that 40 per cent of all women over 50 years, suffer from them. This very frequency makes the subject one on which the general practitioner should be well informed. Unfortunately however, many text-books give erroneous ideas, especially in regard to the treatment of these tumors, so that it is a pleasure to find a book, such as this, the recommendations of which can be safely followed.

The introductory chapter takes up in a general way the classification, life history and the more important complications.

The chapter on anatomy contains an excellent section on the vascular supply of the uterus, the relations of the pelvic organs, and the alterations which result in these relations from the development of tumors in various directions.

A concise tabulation of symptoms, which the author divides into suggestive, characteristic, and confirmatory, together with the points to be sought for in the examination of the patient, comprise a valuable chapter.

The most interesting sections are the 4th, on the development, and the 5th, on the secondary changes in uterine mesodermic tumors. A review of the literature of the histogenesis of sarcomata, myomata and telangiectatic tumors is given in the former, while in the latter, the author discusses necrosis, calcification, and inflammatory changes. He holds the view advanced by Orth and Pfannensteil, that sarcoma commences in myomata *de novo*, and is not a degeneration, as we have been taught by Virchow and Birch-Hirschfeld. Adeno-myoma is only briefly considered.

A review of the long list of medicinal remedies which have been used is then given, the authors belief being that prolonged medicinal treatment is useless.

We wish that the statements on electrical treatment, so strongly recommended by Apostoli, Keith, Playfair and others, were as decided as those in regard to medicines. "Undoubtedly in certain cases, it does produce a definite and reliable effect, while in others it is entirely useless and extremely dangerous. . . . So long as it does not blind patient and surgeon to the actual dangers of delay, in cases which ultimately require operation, so long will it be one of the really effective weapons for use against the disease." Statements with which few American surgeons will agree.

The chapter on surgical treatment is begun by emphasis on the fact that many cases require no treatment whatever. "They are best treated by masterly inactivity." The history of the evolution of the various operations is then given and several pages devoted to the internal secretion of the ovary. Myomectomy (the removal of the tumor *per se*, leaving the uterus *in situ*) is recommended whenever practicable. For hysterectomy, the author prefers the vaginal operation, when the size of the tumor permits.

The 9th chapter contains many excellent points on general technique. An exception must however be taken to the statement in regard to gloves. "Cotton gloves can be boiled or steamed before use, but it seems quite as difficult to sterilize rubber gloves, as it is to sterilize the skin. They certainly cannot be exposed to sufficient heat to render them germ free." (*Sic!*).

The various operations are divided into (1) methods which decrease the nutrition of the tumor; (2) methods which remove the tumor alone; (3) methods which remove the uterus and the tumor; and the details of these operations reviewed.

Chapters on post-operative treatment and final results follow and an excellent bibliography is appended.

Throughout, the text has been carefully prepared and the numerous cases cited are interesting and well selected. The illustrations are fairly good but most of them have no clear detail and are lacking in plastic effect. Figures 35, 36 and 37 are excellent.

B. R. S.

Atlas and Epitome of Ophthalmoscopy and Ophthalmoscopic Diagnosis. By Prof. Dr. O. Haab, Director of the Eye Clinic in Zurich. From the Third Revised and Enlarged German Edition. Edited by Geo. E. de Schweinitz, Professor of Ophthalmology, Jefferson Medical College, Philadelphia. With 152 colored lithographic illustrations and 85 pages of text. (*Philadelphia and London: W. B. Saunders & Co.*, 1901.) Price, $3 net.

With the exception of von Graefe and Arlt no ophthalmologist in Europe possessed such gifts as a teacher nor left such a strong impress upon his students as Horner of Zurich. One finds his former assistants occupying high positions in ophthalmology all over the world.

As regards his industry and in a measure too as regards his other gifts his mantle seems to have fallen upon the shoulders of O. Haab who was once his assistant and who now occupies the Chair of Ophthalmology in Zurich. Haab's work is a welcome addition to our armamentarium.

Most atlases of ophthalmoscopy while they give classic examples of the different fundus affections seldom or at least to a limited extent give us pictures of the deviations or rather modifications of those pictures which are peculiarly characteristic of the different diseases.

As a matter of fact the well-known picture of albuminuric retinitis is seldom seen but we not unfrequently do see albuminuria associated with marked changes in the retina, changes which even if they are not arranged in the classic style have quite the same significance.

The author has kept this point in view throughout and we not only find the so-called typical pictures of well-known diseases but also pictures which illustrate the subvarieties and different stages of the same affection. Curious and very rare ophthalmoscopic pictures are startling but from a practical point of view they are unimportant and for this reason doubtless they occupy no space in Haab's collection.

A number of anatomical figures have been added to illustrate various microscopic conditions and this strikes us as being very appropriate and at the same time a practical departure from the ordinary run of similar works. Part first consists of about sixty pages and is nothing more than a discussion of the general principles of ophthalmoscopy and is about what we find in all text-books on the eye. Much that is said in this chapter is illumined by the comments and suggestions of the editor.

The mechanical part of the work is well done and the whole is embodied in such handy shape as will contribute largely to the success of the work.

R. L. R.

An Atlas of the Medulla and Midbrain. By FLORENCE R. SABIN, M. D. (*Baltimore: The Friedenwald Co., 1901.*) Pages 112.

A study of the labyrinth of the medulla by the student of medicine is ever fraught with uncertainty and misgivings on his part. The anatomy is so complex, the details of the connections of cell and nerve fibre are so complicated, that the majority shrink from obtaining, from available text-book literature, even a superficial insight into its structure.

Dr. Sabin's model of the "relay station" of the central nervous system, now elucidated by a complete commentary, was planned to meet the need for some "simple yet reliable method of aiding the students to obtain a reasonably clear idea of the organ." The text, and plates from the model, the latter from the brush of M. Broedel, fully achieve the purpose of the author.

The eight plates accompanying the volume are all well chosen, presenting clearly to the eye the gross structure of the medulla. To more particularly call attention to each nucleus of origin and fibre tract, and to impress them upon the memory, colors are used to differentiate the several parts, the effect being at once striking and artistic.

The descriptions of the various gray nodes and fibre bands are clear and comprehensive, and are sufficiently concise not to be a drain upon one's time and beget hazy ideas of the whole. Chapters V and VI upon the cerebral nerves and nuclei of origin are not only the most interesting but the most perspicuous of the book.

Diseases of the Nose and Throat. By D. BRADEN KYLE, M. D., Clinical Professor of Laryngology and Rhinology, Jefferson Medical College, Philadelphia; Consulting Laryngologist, Rhinologist and Otologist, St. Agnes' Hospital. Second Edition, Revised. Octavo, 646 pages; over 150 illustrations and 6 lithographic plates. (*Philadelphia and London: W. B. Saunders & Co., 1901.*) Cloth, $4 net.

A review of the first edition of this excellent book appeared in November last. In the present edition very few changes have been made beyond the correction of typographical errors. The work presents the subject of Diseases of the Nose and Throat in a concise manner, keeping in mind the needs of the student and general practitioner as well as those of the specialist. With the practical purpose of the book in mind, extended consideration has been given to details of treatment, each disease being considered in full, and definite courses being laid down to meet special conditions and symptoms. The work is very valuable.

Essentials of the Diseases of Children. By WILLIAM M. POWELL. Third Edition. Revised by ALFRED HAND, JR., Dispensary Physician and Pathologist to the Children's Hospital, Philadelphia. (*Philadelphia: W. B. Saunders & Co., 1901.*)

To condense the present knowledge of any important division of medicine into a volume of two hundred and fifty small pages and not omit much that is essential would be almost impossible and this is true of the present subject.

As the author points out much too little is said of diet and general hygiene to convey the accurate knowledge their importance demands—three and one-half pages being given to "Infant Feeding."

The discussion of the acute infectious diseases is quite as good as the limited space will permit—though it is hardly safe to describe scarlet fever as a "somewhat contagious disease."

On the whole this third edition of Dr. Powell's book is quite up to the standard of books of its class—but it is difficult to see in just what these systems of questions and answers are of benefit to either students or practitioners. The book is well made and unusually free from typographical errors.

R. A. U.

Students' Edition, a Practical Treatise of Materia Medica and Therapeutics, with special reference to the Clinical Application of Drugs. By JOHN V. SHOEMAKER, M. D., LL. D., Professor of Materia Medica, Pharmacology, Therapeutics, and Clinical Medicine and Clinical Professor of Diseases of the Skin in the Medico-Chirurgical College, of Philadelphia, etc. Fifth Edition. Thoroughly Revised. Pages vii-770. Extra Cloth, $4 net. (*Philadelphia: F. A. Davis Co., 1901.*)

In this fifth edition of Dr. Shoemaker's well-known treatise the pages have been thoroughly revised and many new subjects added, but inasmuch as it is designed especially for students, "nothing is included beyond a description of those drugs and preparations which are official in the Pharmacopœias of the United States and Great Britain." Dr. Shoemaker has happily expressed the doses in the metric system, adding their equivalents in the English system. This seems to be a very wise procedure inasmuch as students can only be gotten to write their prescriptions in metric terms when they have to learn their doses in that system. Our Pharmacopœia has already committed itself to this system and it is but the proper sequence that physicians should write their prescriptions in it.

The work is divided into two parts. Part one consisting of seventy-four pages, deals with certain general considerations of the subject introductory to the more detailed study of the various drugs and their uses which follows in the second part. These general considerations consist of definitions, the botanical orders and names of the various medicinal plants, a few pages upon pharmacy and methods of making the various pharmaceutical preparations; prescription writing; methods of administration of drugs; poisons and their antidotes; etc. Though briefly written, it contains many excellent suggestions. Some exception may be taken to the author's use of the term pharmacology, signifying the science of drugs, a study of their natural history, their physical and chemical characters, and the various methods of compounding and dispensing them. Most authors prefer to limit this term definitely to the study of the physiological action of drugs, and it seems to us that this is decidedly a better word to apply to that subject than the one here suggested of "Pharmacodynamics."

In part two the various pharmaceutical products are taken up in alphabetical order. Each is considered under several headings. First its preparations are named; then under "Pharmacology" a description of the drug is given, its source, its physical characteristics, its solubility, reaction, etc.; under "Physiological action" the substance is spoken of in relation to its effects upon animals and man. Next follows the heading Therapy where its usefulness in medicine is expounded; here frequently a number of prescriptions are added. Part two embraces about 650 pages, closely written, and the numberless products, many of which are of so little use in medicine, yet so fully described, make it rather a forbidding book to place

in the hands of the student. At the same time the important subjects are well considered and if the paragraphs upon the therapeutic value of drugs are somewhat optimistic and hopeful, still it seems to be a very useful reference handbook to the student who desires to have a full pharmacopeial armamentarium for his practical work. Nothing is said of such useful therapeutic measures as hydrotherapy, climate, serotherapy, etc., the book being absolutely limited to the consideration of drugs and their administration.

It is to be hoped that some time there will arise a courageous author who will write a book upon treatment in which only really useful remedies, numbering probably over fifty, will be spoken of in such a way that the future student may learn to handle them effectively and scientifically, and the great burden of remembering, even of looking through the scores of utterly antiquated and useless preparations will be avoided.

H. B. J.

A System of Physiologic Therapeutics. Edited by SOLOMON SOLIS COHEN, A. M., M. D. Vol. I, Electrotherapy, by GEORGE W. JACOBY, M. D. In two books. Book I, Electrophysics. 163 illustrations. (*Philadelphia: Blakiston's Son & Co., 1901.*) pp. xv-242.

The volume at hand is the first of a series which will compose a system of physiologic therapeutics, embracing eleven octavo volumes, devoted to the consideration of measures other than medicinal, which experience has shown are beneficial in the cure and prevention of disease. The appearance of such a system of medicine is timely as no author or authors have until now, gathered together in one volume or series of volumes, in English, these methods which are so very important in the treatment of disease. The statement made at the sub-heading of the title page really covers the scope of the work, "The practical exposition of the methods other than drug giving useful in the treatment of the sick." This first volume by Dr. Jacoby, who is so well fitted to write upon the topic, is devoted to electrotherapy and is to be divided into two parts or books, Book I being given up to the physical aspects of electricity with a description of the various forms of apparatus that physicians are likely to use. The further volumes as the announcement and the "foreword" of Dr. Cohen state, will consider Climatology and Health Resorts; Nursing and Care of the Sick; Diet; Hydrotherapy; Serotherapy; etc.

There is surely room for just such a set of books. We have been too prone to think that we were teaching therapeutics sufficiently when we taught our students the old materia medica and the use of mere drugs, forgetful and careless of the importance of the therapeutic value of the methods of which this series of books will speak. That the necessity of this line of teaching has already come into the minds of some men may be seen in Dr. Lauder Brunton's volume entitled "Lectures on the Actions of Medicines," in which he not only writes upon various pharmaceutical products, but also devotes many pages at intervals through the book to diet, massage, counter irritants, hydrotherapy, poultices, etc.; and to the minds of still others, as may be seen in the announcement of one of our medical schools, where in speaking of its course upon Practical Therapeutics, it states that the course teaches among other things "the administration of practical therapeutic measures, the use of massage, the preparation and useful forms of diet, the care of patients considered from the nursing point of view, the treatment of various emergencies, of special diseases by climate, rest, and other practical procedures." This course as advertised then practically epitomizes the work which Dr. Cohen will embrace in his larger system of physiologic therapeutics. The volume before us opens with a foreword by Dr. Cohen on Therapeutics without Drugs, and comprises an argument for the need of such a series of books. Here he justifies briefly the term "physiologic therapeutics" by referring to Mr. Herbert Spencer's definition of life, maintaining that the subjects to be treated in the forthcoming volumes merely assist in aiding nature to preserve that normal equilibrium within its environment which constitutes health, and therefore become physiologic in their curative action.

The use of drugs, on the other hand, for therapeutic purposes he would term "artificial," inasmuch as through them there is introduced into the organism substances ordinarily absent therefrom and foreign to its composition. It is not his purpose, however, to antagonize the latter therapeutic measures in the least, for he admits "having a robust faith in the power of good of the right drug, given in the right dose, at the right time."

That every one will subscribe to all of Dr. Cohen's conclusions I am inclined to doubt; for instance: on page ix there is found the following paragraph: "The pathologic influence of emotion is well shown in the evolution of exophthalmic goiter and in the protean manifestations of hysteria, etc., etc." This seems so far as the former disease is concerned rather a bold statement, and I should be surprised to find that many would admit the basis for the production of exophthalmic goiter was to be found in an emotion.

The volume is devoted through 225 or more pages to a description of the terms used in electricity, the physical explanation of electricity, the various methods of producing it, and the arrangements for controlling, measuring, and applying it. The text is very fully illustrated and the subject presented so clearly that one with little conception of the real nature of the subject may get a fair idea of it. There is gathered together in this one volume knowledge which one could otherwise only acquire through numerous books upon physic and medical electricity, and to that extent it is extremely useful. Nothing, however, in this part of Volume I is said upon the therapeutic value of electricity; that topic, doubtless, being reserved for part two of Volume I.

It seems questionable whether many medical men will care to learn the various facts in regard to electricity which are here set forth. It is knowledge for the electrician rather than for the every-day practising physician; knowledge which is necessary for one establishing an electro-therapeutic institution, but not for the man who applies the electrodes for diagnostic or therapeutic purposes. From a mechanical point of view the book is admirably gotten up. It is a credit to its makers. The paper is heavy and fine; the printing clear, type of good size, and well spaced, and the illustrations excellent.

It is greatly to be hoped that the completed work will not become so voluminous as to lose its general usefulness. Completeness with brevity, conciseness with lucidity should be the aim of all medical editors.

H. B. J.

Anomalies of Refraction and of the Muscles of the Eye. By FLAVEL B. TIFFANY, A. M., M. D. Author's Fourth Edition. (*Kansas City, Mo.: Hudson-Kimberly Publishing Co., 1900.*)

It was Job, we believe, who wished that his adversary had written a book. If Dr. Tiffany has any adversaries, or, at all

events, any that are inclined to be critical, he has unquestionably afforded them, in the publication of the book we are called upon to review, such an opportunity as the great lamenter must have had in mind when he expressed this wish.

As the "reviews" which accompany the book state, it is "elaborately illustrated"; and it contains unquestionably, much useful information upon the subject of which it treats; but that it has been "carefully revised," and the "few errors [of the earlier editions] corrected," as is claimed in the publisher's notice, we are hardly inclined to concede. Indeed, we have seldom glanced through a book that seemed to be so sorely in need of what this one is supposed to have just received—"careful revision," and though a "few errors" may have been corrected there are a host of others still awaiting elimination.

One of the first of these to attract our attention occurs in the preface, and seems to have been handed down, without detection, from the first to the present, fourth, edition. "Many instruments and *apparati*,"[1] the author—unmindful of his declensions—tells us, "have been invented," etc. Whether heterophoria and ametropia deserve to be characterized, as they are in another part of the preface, as "vast subjects . . . . still wrapped in a halo of uncertainties" is, of course, a matter simply of taste; and the same observation applies to this, which we find on p. 69: "it is only when there is an appreciable variation in the curvature that the eye is stigmatised (sic) astigmatic."

The definition on p. 65 of an ametropic eye as one which cannot focus parallel rays of light, "without an effort of accommodation," is distinctly erroneous; for it is evident that ametropia, so defined, would not include myopia. The statement on p. 107 that "more or less choroidal blood-vessels may be seen through the retina, especially in a dark-complexioned person," is open to criticism upon more grounds than one; but we shall content ourselves by pointing out that it is in blondes, as a rule, that the choroidal vessels are most plainly seen, and in brunettes that they are least distinguishable.

On p. 156 we read, with some surprise, "the hyperopic eye is an undeveloped eye, with sight not up to the normal standard of distinctness for either near or distant objects"; but, notwithstanding this unequivocal statement, we are told on the following page that "the hyperopic eye of a moderate degree with good power of accommodation may have the normal amount of vision"; and, again, on p. 158, that "hypermetropes with less than 3.50 D., with good accommodation, as a rule, have $\frac{20}{XX}$ or normal vision." On p. 159 we learn that "the strongest glass that they [hypermetropes] *require* without the use of a mydriatic indicates the *manifest* hypermetropia." It is hardly necessary to point out that most young hypermetropes, though a considerable part of their error of refraction may be made manifest by painstaking effort *require* no glass at all to obtain normal distant vision. Quite as surprising is the statement on the same page that "the manifest [hypermetropes] is *usually* apparent without a mydriatic."

Space does not permit us to call attention to all of the shortcomings which have arrested our attention in looking over the pages of Dr. Tiffany's book; but, as examples of many others, the following may be cited: "Hypermetropia can be corrected, but may not be *entirely* cured" (p. 168). "Frequently we have what is known as a *spasm of accommodation*, which causes partial paralysis or paresis of the ciliary muscle" (p. 169). "It is now a conceded fact that hyperopia is often a primary cause of . . . trachoma" (p. 170). Possibly "*hyperboloidical* glass," on p. 209, is a printer's error; but, if not, it is evident there is still virgin soil for Dr. Gould to delve in. "It is much better to under-correct [in performing a tenotomy] and have to repeat the operation than to over-correct and be obliged to advance the *opposing* (sic) muscle." (p. 247).

Far be it from us to belittle the ill effects of eye strain, whether due to refraction or muscular anomalies; but we cannot but feel that the author has drawn an unnecessarily lurid picture in thus describing the consequences of heterophoria: "Life becomes a burden; despondency, melancholia, insomnia, and suicide may be the end" (p. 230). And again, "in neurotic and feeble patients the muscular errors or insufficiencies may produce aphoria, diarrhœa, pains of the ovaries . . . . and insanity even" (p. 233).

We are not surprised to learn, from the "reviews," to which allusion has been made, that Dr. Tiffany's treatise is highly thought of by jewelers and opticians and by the Philadelphia "Optical College."

S. T.

[1] The italics here and in many other places in this review are our own.

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